Economic Council
of Canada

Conseil économique
du Canada

Working Paper
Document de travail

Working Paper No. 36

Schooling and the Statistics Canada Survey of Literacy Skills Used in Daily Activities

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With the assistance of Francine Proulx

1992

ISSN 1180-3487

92-06851/

Schooling and the Statistics Canada Survey of Literacy Skills Used in Daily Activities

The findings of this paper are the sole responsibility of the author.

Dedicated to the memory of

Hermann Hettenhausen
Elementary School Teacher
Budapest, 1930-36

by his grateful pupil.

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Foreword

To meet increasing global competition, Canada's quest for productivity improvement must focus on technological advance and the skill needs of the knowledge economy. Education and training will thus be a cornerstone of any long-run strategy for economic development. Accordingly, the Economic Council of Canada has undertaken a study of this complex and controversial field. The analysis considers a variety of topics concerned with quality and the efficiency of resource allocation in the education and training system.

One important aspect of the study is the existence of considerable interprovincial differences in the educational achievement. The present study uses the Statistics Canada microdata of the Survey of Literacy Skills Used in Daily Activities to investigate interprovincial differences in functional literacy and numeracy, and their effect on personal income. The author, Thomas T. Schweitzer, is a senior economist on the staff of the Council.

Judith Maxwell
Chairman

The Reasons for the Paper

The Second International Science Study [IEA 1988; Crocker 1990] on international and interprovincial comparisons of cognitive achievement suggested the existence of a declining trend going from west to east within Canada. The Southam Literacy Test [Southam News 1987], which confirmed this trend, was criticized on methodological grounds and also because its response rate was very low (approximately 14 per cent). In 1989 Statistics Canada conducted a large-scale survey on literacy skills used in daily activities, the quality of which was much superior to that of the Southam test. The sample was a stratified weighted sample of 13,571 persons aged 16-69 with a response rate of 70 per cent. The highest response rate was that of Prince Edward Island (79 per cent), the lowest was Ontario (64 per cent).

The survey investigated the respondents' answers (in English or in French, according to the respondent's choice) to a set of test instruments. A scoring system was devised for reading proficiency and numeracy, which had the following properties: the scores had a mean of 250.5 and a standard deviation of 50 (for technical details of the survey, see Statistics Canada [1990]).

Statistics Canada collected a great deal of additional information on the respondents, including:

- province of residence;
- size of area of residence;
- age;
- sex;
- language of interview;
- country and province of birth;
- year of first immigration to Canada;
- years and level of schooling outside Canada;
- years and level of schooling in Canada;
- type of schooling (academic or business/vocational);
- physical and learning disabilities;
- first language of childhood;
- age at first starting to learn the language of the interview;

- parents' immigrant status;
- parents' age at their immigration;
- surveyed person's labour force experience in the preceding 12 months, including number of weeks worked and whether predominantly full-time or part-time;
- industry of employment;
- occupation;
- estimate of personal income; and
- type of incomes received (labour, capital, transfer, and so on).

This is a rich database and it permits the testing of a variety of hypotheses:

- that the quality of education (as reflected in the literacy and numeracy scores) declines from west to east. Persons born in Canada are more likely to have received their schooling in the province of their birth than elsewhere, so we can establish the province of schooling with reasonable confidence. The richness of the database permits standardization for other influences, which may conceivably also have an influence on the scores;
- that interprovincial "migrants" are more education-conscious than "stayers." The higher scores of the western provinces may be due to the fact that they were settled later than the central and eastern provinces;
- that immigrants are more education-conscious than native Canadians;
- that the quality of education has changed over time; and
- that literacy and numeracy has a substantial influence on gaining and retaining employment, on the number of weeks worked, and on the type of occupation. Also, we can test whether the reading and numeracy scores have an influence on personal income *beyond* these effects.

Some caveats must be mentioned here.

For factors influencing the literacy/numeracy scores our analysis will treat native-born respondents and foreign-born ones separately. The latter ones may have language problems, and their schooling experience may also differ from that of the native-born respondents.

For the writing test Statistics Canada used only two test items. This made it impossible to develop a score with a mean of 250.5 and a standard deviation

of 50. In order to be able to analyse the writing results we created a make-shift scale. This is discussed in Appendix A.

In analysing the effect of reading/numeracy on personal income we did not only separate our sample by native- or foreign-born, but also by gender. So, while in the analysis where the dependant variable is the reading/numeracy/writing score we have two sets of equations each (by country of birth), in the analysis of personal income we have four (country of birth, cross-classified by gender).

The overall size of the sample is 9,455 (4,184 males and 5,271 females), but the test was not administered to 104 persons because of language difficulties. Of those who took the test, 8,246 were born in Canada, 1,102 were born abroad, and 3 did not state their country of birth. By the time we break down the foreign-born respondents by gender, we are left with 502 males and 600 females, a rather modest-sized sample for regression analysis that uses approximately 30 (mostly dummy type) variables for the income analysis and more than 70 variables in the literacy analysis. Unavoidably, some of the cells are rather sparse and the conclusions will have to be drawn with caution, even when the results are statistically significant.

The sample is a stratified multi-stage random one, augmented by the purchase of additional samples by New Brunswick, Newfoundland, Ontario, and Alberta. The Statistics Canada microdata file supplies the weights needed for appropriate statistical analysis of data of this sort. All our reported results are based on weighted OLS regressions. The coefficients are significant by the one-tailed test at the 5-per-cent level if the *t*-values are less than or equal to 1.46. We included Prince Edward Island in our analysis. However, Statistics Canada has warned that the sample size of that province is too small for publication. In our tables we have suppressed the Prince Edward Island results and marked them with a double dash (– –).

We shall follow the practice of the Education Testing Service [Rock et al. 1986] and shall regard statistically significant differences of less than 0.1 standard deviation (5 points) as negligible, those of 5 to 10 points as small but practically significant, 10 to 25 points as moderate-sized, and 25 points and over as large.

Regression Results

Reading, Numeracy, and Writing

Respondents Born in Canada

Tables 1 to 4 and Appendix Tables A-1 to A-4 contain the results for the Canadian-born respondents.

Schweitzer [1992] suggested that there is a declining trend from west to east in cognitive achievement. In Table 1 (columns 1-A and 1-B) we report the regression results for the reading and numeracy tests as dependent variables, using dummy variables for the birth provinces of the surveyed persons (the reference group is British Columbia and the Yukon). We assume that the province of birth is in most cases also the province in which the surveyed person received her/his education. While the fit of the two regressions is not very strong, the results are strongly significant. They indicate that Quebec and the eastern provinces in particular are doing much worse than British Columbia. Appendix Table A-1 (column 1) confirms this for writing.

In Table 1 (columns 2-A and 2-B) and Appendix Table A-1 (column 2) we add the gender variable (females are the reference group). In all three branches of the test (reading, numeracy, and writing) women are doing better than men, but the difference is not always significant and almost always minor.

We hypothesized that migrants show, other things being equal, higher cognitive achievement than stayers. In Table 1 (columns 3-A and 3-B) and Appendix Table A-1 (column 3) we add a dummy variable for those who have been interviewed in a province different from that of their birth. This variable does not capture all interprovincial migrants, because by the time of the Statistics Canada interview some migrants may have returned to their province of birth. Nevertheless, we judge that it is an adequate proxy for interprovincial migrants. The respective columns indicate that movers are doing better than stayers.

In Table 2 (column 1-A and 1-B) and Appendix Table A-2 (column 1) we shall attempt to answer two questions. Are those born in the western provinces scoring higher because they have received *more years* of schooling than those in the eastern provinces? Or are they scoring higher because they have received *better* schooling? In these columns we add a set of dummy variables for the highest level of schooling completed (high school graduates are the reference group).

Table 2 (column 1-A and 1-B) and Appendix Table A-2 (column 1) demonstrate the expected, very big, effect the amount of schooling has on reading (both at the very high and very low end of the schooling scale), on numeracy, and on writing (particularly at the low end). The $\bar{R}^2$ increases from 0.045 to 0.356 for reading, from 0.038 to 0.264 for numeracy, and from 0.033 to 0.217 for writing. The introduction of the schooling variables reduces the coefficients of the province-of-birth variables but most remain statistically significant, and those of Quebec and the eastern provinces fairly big. This suggests that the surveyed persons born in Quebec and the eastern provinces have received less education than those born in the western provinces (entering the schooling variables reduces the coefficients of the province of birth) *and* also poorer education (the coefficients remained big and statistically significant).

The coefficients of the movers are cut in half by the introduction of the schooling variables. This suggests that movers are more educated than stayers. The coefficients remain sizeable and statistically significant, suggesting that movers are more literate/numerate than stayers, even after allowance for the movers' higher level of schooling.

Older people have received their education at an earlier date than the younger cohorts did. The oldest published age group was born between 1920 and 1934 and must have started school between 1926 and 1940. The youngest group was born between 1965 and 1973 and started school between 1971 and 1979. In Table 2 (columns 2-A and 2-B) and Appendix Table A-2 (column 2) we add dummy variables for the age cohorts (the reference group is the 35-44 age group, which was born between 1945 and 1954 and started school between 1951 and 1960). We find that the oldest age group is doing quite poorly and, to a lesser extent, so does the 45-54 year old cohort, particularly in reading. Also, the numeracy score of the most recent cohort is weak. Later we shall show that the coefficient of the reading score of the most recent cohort turns significantly negative if we introduce highest parental education as additional variables. This suggests that after standardization for parental education, the most recent cohort scores significantly lower than the reference group. The addition of the age-cohort dummies has little effect on the coefficients of the other variables. It increases the fit of the equation by 0.010 to 0.032 points.

As mentioned before, the reading/numeracy/writing scores of interprovincial movers are higher than those of the stayers. We also hypothesized that the offspring of interprovincial migrants would score higher than the offspring of stayers. We cannot test this hypothesis because the questionnaire did not ask the surveyed persons whether their parents were interprovincial migrants. However, the survey did ask whether the father and/or mother of the surveyed person were immigrants to Canada and whether the parents were aged over or under 16 when they immigrated. We find that if the mother was an immigrant and she arrived in Canada before she was 16, this has a statistically significant, positive, though minor, effect on the surveyed person's score (Table 2, columns 3-A and 3-B; Appendix Table A-2, column 3).

A recurring finding of the literature of education maintains that the offspring of families of higher socio-economic status tend to show higher cognitive achievement. The Statistics Canada survey did not inquire about the parents' income or occupation, but it did ask for their highest educational level. We use this indicator as the proxy for the parents' socio-economic status, and the results are reported in Table 3 (columns 1-A and 1-B) and Appendix Table A-3 (column 1) (the reference group is high-school diploma of the higher-educated parent). On the whole, the data suggest that low parental education results in lower scores of the offspring (given the variables discussed before).

The size of the area of residence influences the literacy scores (Table 3, columns 2-A and 2-B; Appendix Table A-3, column 2). Taking urban areas with a population of 500,000 or over as the reference group, we find that those of 100,000 to 500,000 are doing significantly better in reading and writing (but not in numeracy). Urban areas of less than 30,000 are doing worse in reading and numeracy (but not in writing). Rural areas are doing about as well as urban areas of 500,000 except that rural areas do better in writing. The overall picture is rather inconsistent and confusing.

The surveyed persons were also asked whether their secondary school program was of the academic/college preparatory type or of the business (commercial) or trade/vocational type. Table 3 (columns 3-A and 3-B) and Appendix Table A-3 (column 3) indicate that those with an academic-type program are scoring higher (other things, including the level of schooling, being equal) than those with a business, trade, or vocational program.

Our results could be possibly distorted by a few outlier observations. Statistics Canada asked questions regarding physical and learning disabilities. Because only a small number of surveyed persons did report such problems (the maximum number was 360 Canadian-born surveyed persons with hearing problems at the time of the interview), the statistical significance of these findings should be treated with caution. Nevertheless, we decided to include these variables in our analysis, in order to avoid possible outliers distorting our results pertaining to the other variables. Table 4 (columns 1-A and 1-B) and Appendix Table A-4 add the following variables to the previously discussed areas:

- visual problems before age 16;
- visual problems now;
- hearing problems before age 16;
- hearing problems now;
- speech disability before age 16;
- speech disability now;
- learning disability before age 16;
- learning disability now;
- any other disability or health problem of six months or more that affected your learning before age 16; and

- any other disability or health problem of six months or more that affect your learning now.

The following results show up with great consistency: a learning disability at the age of 16 or at the time of interview has a major statistically significant negative effect on all three types of tests. So do speaking disabilities or health problems of a six-month duration or more at the time of the interview. The other results are either statistically not significant or not consistent.

Why do Ontario and the eastern provinces do consistently worse than the western provinces? Are the literacy/numeracy scores perhaps influenced by the economic prosperity of the provinces? Perhaps richer provinces can afford not only more education (as reflected our schooling variables), but also better education? Is this what explains the coefficients of the province of both variables of Table 4 (columns 1-A and 1-B) and Appendix Table A-4 (column 1)?

In order to shed some light on this question we constructed an average relative personal income variable for each province. Using Statistics Canada national accounts data for the years 1926-89, we calculate every year for each province the personal income per capita relative to the corresponding national figure. We average out each province's relative per-capita personal income over the 1926-89 period (1949-89 for Newfoundland). In Table 4 (columns 2-A and 2-B) and Appendix Table A-4 (column 2) we replace the province-of-birth dummy variables by this new relative prosperity proxy variable. The coefficient of this new variable is positive and highly significant. However, the $\bar{R}^2$ of the equation is lower than that of the previous one.

Table 6 (columns 1 to 3) compares the effect of the province-of-birth dummies with that of the relative income variable. Several results show up with great consistency.

- Relative average personal income "explains" about two thirds of the weak performance of Quebec and the eastern provinces, but there remains a substantial "unexplained" residual (Table 6, column 3).

- The Prairie provinces are doing *better* than one would expect on the basis of their relative income.

- Ontario is doing *worse* than one would expect on the basis of its high relative income.

It may be that it is not the general prosperity of a province – as proxied by the relative per-capita personal income – that is the explanation of the differences in educational achievement, but relative educational expenditure per

student. This hypothesis cannot be tested on the complete sample of Canadian-born persons because we have comparable information on educational expenditure per person only from the 1960-61 school year on. We shall test the explanatory power of relative educational expenditure per full-time primary and secondary students on the 16-34 year old cohort, that is, those who were born between 1955 and 1973 and who entered school between 1961 and 1979.

Table 4 (columns 3-A and 3-B) and Table A-4 (column 3) contain the results for the 16-34 year old cohort. Once again, our previous finding is confirmed: the central and eastern provinces score lower than the western ones in reading and numeracy. In Table 5 (columns 1-A and 1-B) and Table A-4 (column 4) we discard the dummy variables for the provinces and introduce relative average per-capita personal income instead. In each instance the $\bar{R}^2$ deteriorates. In Table 5 (columns 2-A and 2-B) and Table A-4 (column 5) we replace relative per-capita personal income by relative educational expenditure per student. The $\bar{R}^2$ deteriorates further, except in the case of the writing test. The scores assigned by us to the latter is done in a crude and makeshift manner (see the appendix); its results are, therefore, less reliable than those of the reading and numeracy tests.

Table 6 (columns 4 to 7) summarizes our findings for the 16-34 age cohorts. Some examples will illustrate how to read these columns. Newfoundland scored 24.7 points lower in reading than British Columbia (column 4). But Newfoundland has a lower per-capita personal income than British Columbia. Calculations based on our equation of Table 5 (column 1-A), which uses the per-capita personal income variable, predict that Newfoundland would score 9.3 points lower than British Columbia (Table 6, column 5). Thus Newfoundland scores 15.4 points lower than one would expect on the basis of its lower per-capita personal income (Table 6, column 6). Another example: Ontario scores 9.8 points below British Columbia in reading (Table 6, column 4). Ontario's per-capita personal income was higher than that of British Columbia. Calculations based on our equation using average personal income indicate that Ontario should have scored 1.0 points higher than British Columbia (column 5). Ontario is, therefore, scoring 10.8 points lower than British Columbia than one would expect on the basis of their respective per-capita personal incomes (column 6).

Quebec provides an interesting third example. Quebec scored 11.7 points below British Columbia in numeracy (Table 6, column 4). Quebec's per-capita personal income was lower than that of British Columbia, so according to calculations using the equation of Table 5 (column 1-B), Quebec should have scored 5.2 points below British Columbia (Table 6, column 5). This would leave 6.5 points of Quebec's inferior performance unexplained by its lower per-capita personal income (column 6). Using expenditure per student and

Table 5 (column 2-B), we calculate that Quebec should have scored 2.6 points *higher* in numeracy than British Columbia, because Quebec's educational expenditure per student was higher in the 1961-89 period than that of British Columbia (Table 6, column 7). So Quebec is doing 14.3 points worse than British Columbia, compared to the performance one would expect on Quebec's higher expenditure per student (column 8).

Table 6 (columns 3, 6, and 8) indicates that compared to the West, the central and eastern provinces are doing worse than one would expect on the basis of their relative incomes and spending per student.

Summary of Results for Those Born in Canada

- Even after allowance for all the other variables discussed, there remains a suggestion of surveyed persons born in Ontario scoring lower than those born in the western provinces. Those born in Quebec are scoring lower and those born in the eastern provinces, considerably lower. These differences are only partially explained by the relative economic prosperity of the provinces or their educational expenditures per student.

- There is a suggestion of women scoring higher than men in reading and writing, but not in numeracy.

- Interprovincial movers are scoring slightly higher than stayers.

- The offspring of immigrant mothers are scoring slightly higher than other Canadian-born people, if their mother immigrated to Canada before she was 16 years old.

- Schooling has the expected very major effect on the three scores.

- Takers of an academic program in high school score higher than takers of vocational programs.

- Parental education does have, *ceteris paribus*, an effect on the score of their offspring.

- The examination of the scores of the age cohorts indicates that, even after the allowance for health problems, the cohort born between 1920 and 1934 scores low. This suggests that the quality of their education was (after allowance for level of schooling) lower than that of the cohort born between 1945 and 1954. There is also an indication of the 1965-73 cohort doing poorer in writing, and noticeably poorer in numeracy, than the 1945-54 cohort. However, this does not seem to hold true for the writing test.

- For Canadian-born people, the analysed variables describe 41, 30, and 24 per cent of the total variance in reading, numeracy, and writing scores, respectively.

- The amount of schooling has by far the biggest predictive power on the scores. Province of birth (and presumably of education), age, infirmities, parental education, and migrant status also contribute to the goodness of fit, though to a much lesser degree. The contributions of gender, mother's immigrant status, areas of residence, and type of high-school program, while statistically significant, are minuscule.

Foreign-Born Respondents

For those born outside Canada the analysis becomes more complicated. The variables representing the *province* of birth become inappropriate and are replaced by other variables representing the *country* of birth. Also we decided to analyse the effect of schooling outside and inside Canada as separate variables, and to take explicit account of the date of immigration into Canada and of the age the surveyed person first acquired the language of the interview. The sample size of those born outside Canada (1,102) is much smaller than those born in Canada (8,206). The statistical reliability of our results are therefore lower in this section.

In Table 7 (columns 1-A and 1-B) and Appendix Table A-5 (column 1) we report the scores as function of country of birth (grouped). The reference group is the United States. All regions except Northern Europe report substantially lower reading and writing scores, and all except Northern and Western Europe substantially lower numeracy scores. It will be shown later that after the introduction of additional variables, only South America (defined as all countries in South America, plus those in Central America, the Caribbean, and Bermuda), Southern Europe (defined as Albania, Andorra, Cyprus, Gibraltar, Greece, Italy, Malta, Portugal, San Marino, Spain, Vatican City State, and Yugoslavia), and Asia and Oceania score significantly lower than the reference group in reading, writing, and numeracy. Northern Europe (Ireland, United Kingdom, Denmark, Finland, Iceland, Norway, and Sweden) and Eastern Europe (Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, and the USSR) do not differ significantly from the United States. Western Europe (defined as Austria, Belgium, France, Liechtenstein, Luxembourg, Monaco, Netherlands, Switzerland, and West Germany) scores significantly higher in numeracy (Table 11 and Appendix Table A-9).

As for gender (Table 7, columns 2-A and 2-B; Appendix Table A-5, column 2), our findings for foreign-born people differ from that of the corresponding Canadian-born people. Foreign-born males score higher than females

in reading and writing (but there is no statistically significant difference between the genders in numeracy among the foreign-born respondents).

In Table 7 (columns 3-A and 3-B) and Appendix Table A-5 (column 3) we introduce the year of immigration (immigrants prior to 1950 are the reference group). At first sight it seems that the date of immigration matters a great deal for the reading and writing score (though not for numeracy); however, we shall see later that this is not consistently so. For reading and writing, as the age of the interviewed person is introduced as an explanatory variable, the year of immigration becomes almost always statistically non-significant (Table 10, column 1-A; Appendix Table A-8, column 1). In the case of numeracy, however, we find a steady, substantial, and statistically significant deterioration with each decade of immigration since 1950 (Table 10, column 1-B).

The variables representing schooling received abroad (Table 8, columns 1-A and 1-B; Appendix Table A-6, column 1) have high-school diploma as their reference group. At first sight the results of these columns seem surprising. The highly educated groups (with at least some postsecondary education) have high, positive, and statistically significant coefficients, but the coefficients of the less educated groups, while negative, are not significant. However, we shall see that once we adjust also for education received in Canada, the negative coefficients of lower education received abroad also turn highly significant.

This is demonstrated in Table 8 (columns 2-A and 2-B) and Appendix Table A-6 (column 2), where we introduce the variable "Did you take any courses in Canada which can be used as credits towards a certificate, diploma, or degree?" (the reference group is the "no" category). Not only are the coefficients of this variable positive, very big, and highly significant in all three branches of the literacy test, but its introduction tends to increase the absolute (negative) size of the coefficients of low education received abroad and to render them significant. The goodness of fit as indicated by $\bar{R}^2$ increases dramatically.

In Table 8 (columns 3-A and 3-B) and Appendix Table A-6 (column 3) we specify the education received in Canada (the reference group is high-school diploma). On the whole we find that low education tends to yield statistically significant negative coefficients. A bachelor or higher degree adds a statistically significant positive effect to that of having studied for credits in Canada in the case of reading and numeracy, but not in the case of writing. This may be due to a weakness in the design of the writing test described in Appendix A.

The Statistics Canada test also inquired whether the high-school program of the surveyed persons was of the academic/college preparatory type or of

the business/commercial/vocational type. Using the latter as the reference group, we find that the academic program results in positive coefficients, but only in the case of reading does the result remain substantial and consistently significant when we add further variables (Table 9, columns 1-A and 1-B; Appendix Table A-7, column 1).

Did the fact that the surveyed person's first language was not the language of the survey have an effect on the test results? Table 9 (columns 2-A and 2-B) and Appendix Table A-7 (column 2) would suggest that immigrants of other mother tongues do significantly worse in all three branches of the test than do those of English or French mother tongue. However, Table 9 (columns 3-A and 3-B) and Appendix Table A-7 (column 3) show that this is not necessarily so. The effect of the mother tongue is irrelevant in the case of reading, if the immigrant started learning the language of the survey before the age of 5 (the reference group). The same holds true for writing before the age of 11, and for numeracy before the age of 16. However, in all three branches of the test the deterioration becomes quite dramatic if the foreign-born person started learning English or French after the age of 15.

As we did in the case of Canadian-born people, we also investigate the effect of age on the test scores of foreign-born people. In contrast to the latter, where the results suggest an inverted and upside down J-shape (with the 35–44 year old cohort as the reference group), test results of the foreign-born respondents yield steady deterioration with increasing age, but only the 45-54 and 55-69 age groups do significantly differ from the reference group (Table 10, columns 1-A and 1-B; Appendix Table A-8, column 1).

In the analysis of Canadian-born persons we found that high parental schooling did matter, but only in the sense that very low parental education had, *ceteris paribus*, an unfavourable effect on the surveyed person's test scores. Essentially the same results emerge for foreign-born persons, except that high parental education improves the offspring's reading score, but not that of numeracy and writing (Table 10, columns 2-A and 2-B; Appendix Table A-8, column 2).

The effect of the size of residence is inconsistent and essentially negligible (Table 10, columns 3-A and 3-B; Appendix Table A-8, column 3).

As for the effect of bodily or mental infirmities, the sample is too small to draw conclusions. The only consistent findings are that those foreign-born persons who reported hearing problems at the time of the interview were scoring lower in all three branches of the test than those without such problems (Table 11, columns 1-A and 1-B; Appendix Table A-9).

One of our working hypotheses was that migrants are more educationally ambitious than native Canadians. The Statistics Canada test enables us to

compare the highest level of schooling of native and foreign-born surveyed persons with the highest level of their parents. We investigated the 25-44 year old group. This group contains persons born after World War II, who have, in most cases, completed their formal schooling. The results are found in Table 12. They show that for each level of parental education the 25-44 year old foreign-born persons are, on the whole, much more likely to have received postsecondary education than Canadian-born persons. This confirms our working hypothesis. The other interesting finding is that in the case of foreign-born persons the daughters of parents with only primary education have about the same chance of going on to postsecondary education as the Canadian-born daughters of parents with such low education, but the foreign-born sons have almost 2.5 times the chance of their Canadian-born counterparts. This suggests that foreign-born parents with low education are much more ambitious for the academic career of their sons than of their daughters.

Summary of Results for Those Born Outside Canada

- After allowance for all the factors discussed, the immigrants from South America, Southern Europe, and Asia and Oceania are scoring lower than those from the United States.

- Males are scoring higher in reading and writing, but not in numeracy, than females.

- Schooling has a very major effect on the scores.

- Schooling in Canada has an even bigger effect than schooling abroad, particularly at the lower level. At the postsecondary level, schooling abroad has about the same effect on the scores as Canadian postsecondary schooling.

- A mother tongue other than the language of the interview did not necessarily handicap the immigrant, provided he/she started learning English or French at an early age (say, before the age of 11). However, those who started learning it after 15 were scoring consistently lower than those of English or French mother tongue, or those who started earlier.

- Old immigrants were scoring low.

- Low parental education had, *ceteris paribus*, an unfavourable effect on the scores of the foreign-born respondents.

- Area of residence had no effect.

- Among infirmities only hearing difficulties have a consistent, substantial, statistically significant unfavourable effect. It is surprising that, in contrast

to Canadian-born people, learning problems do not have a significant unfavourable effect. Perhaps the sample was too small – only nine foreign-born persons reported learning problems before the age of 16, and eight persons at the time of the survey.

- The discussed variables account for 60, 49, and 43 per cent of the variance of reading, numeracy, and writing scores, respectively, of those born outside Canada. The most important predictors of the scores are the country of birth, education received abroad and, even more so, education received in Canada, and at what age the person surveyed started learning the language of the interview. Of lesser importance are gender, decade of immigration, type of high-school program, first language, and infirmities. The effect of area of residence is minuscule.

The Reading and Numeracy Scores, and Personal Income

The Statistics Canada survey also collected information on the personal income and the labour-market experience of the surveyed persons. In this section we shall summarize our findings on the ways the reading and numeracy scores influence a person's income.

The dependent variable of our analysis is personal income in 1988, before taxes and other deductions, as reported by the person surveyed. We scored a response of:

No income	as	$0
Less than $5,000	as	$2,500
Between $5,000 and $10,000	as	$7,500
Between $10,000 and $15,000	as	$12,500
Between $15,000 and $20,000	as	$17,500
Between $20,000 and $30,000	as	$25,000
Between $30,000 and $40,000	as	$35,000
Between $40,000 and $50,000	as	$45,000
Between $50,000 and more	as	$60,000

The surveyed persons also reported whether they received, in 1988, income from:

- wages, salary, or self-employment (we treated these as labour income);

- government programs, such as family allowance, unemployment insurance, social assistance, Canada or Quebec Pension Plan, or Old Age Security (we treated these as government transfer payments);

- interest, dividend, investments, or private pensions (we treated these as investment income); and

- any other sources, such as alimony, scholarship, and so on (we treated these as other income).

The questionnaire inquired whether the surveyed person had income from any of these sources, but not how much from each source.

As in the analysis of reading, numeracy, and writing, we treated Canadian- and foreign-born people separately. Also, because the earnings of women are usually lower than earnings of men of similar age, education, and occupation, we performed separate analyses on males and females. Thus cross-classifying by birth and gender we obtained different results for:

- Canadian-born males;

- Canadian-born females;

- foreign-born males; and

- foreign-born females.

Canadian-Born Males and Females

Our starting hypothesis was that reading and numeracy scores significantly influence personal income. We summed the reading and numeracy scores for each surveyed person. This proved to have a distribution with a mean of approximately 510 and a standard deviation of 100. In Table 13 (columns 1-A and 1-B) we regress the personal income of Canadian-born males and females, respectively, on their combined reading and numeracy scores. While the combined score explains only about 8 per cent of the total variation in income, its coefficients are highly significant.

It would be, of course, extremely naive to expect that functional reading and numeracy skills, by themselves, would explain a big part of the variation in income. Many other factors contribute to this variation. It is, for instance, well known that there is a pronounced life-cycle pattern in labour income – the most frequent component of personal income. In Table 13 (columns 2-A and 2-B) we add the variables age and age squared. The coefficients of these age variables are highly significant and have the expected sign (positive for the linear, negative for the quadratic). They triple the explained variance for males, and double it for females. The coefficients of the combined score remain about $57 and $39, respectively.

The province of residence may have a significant additional effect on personal income. Using British Columbia as the reference group, we add a set of dummy variables, one for each of the other provinces (Table 13, columns 3-A and 3-B). These variables add only slightly to the goodness of fit of the equation.

The language of the survey has a mixed effect on personal income. French language has a minor and non-significant negative effect on the income of Canadian-born males. In the case of Canadian-born females, those choosing French as their language of interview have a bigger, and significant, negative coefficient (Table 14, columns 1-A and 1-B).

In what way does the combined score influence personal income? In Table 14 (columns 2-A and 2-B) we enter two dummy variables that indicate whether the surveyed person was employed full- or part-time in the past 12 months. These variables have very highly significant positive coefficients. At the same time the coefficients of the combined scores drop substantially but remain significant. This suggests that persons with high scores are having higher incomes because they are more likely to be employed. The fact of employment tends also to explain more of the variance in personal income: $\bar{R}^2$ is substantially higher in Table 14 in columns 2-A and 2-B than in columns 1-A and 1-B.

Not only are persons with higher scores more likely to be employed, they are also working more weeks per year (i.e., they are less likely to have one or more spells of unemployment). In Table 14 (columns 3-A and 3-B) we introduce multiplicative variables of weeks worked with full-time and part-time employment, respectively. These reduce the coefficients of the scores further (but leave them highly significant) and increase $\bar{R}^2$ by a substantial amount.

Labour income is only one of the sources of personal income investigated in the literacy survey. In Table 15 (columns 1-A and 1-B) we introduce dummy variables for the presence of investment income, government transfer income, and other income. In the case of males, the coefficient of investment income is positive, big, and highly significant. In the case of females, this holds true also for investment income and for other income. At the same time the coefficient of the combined score declines further, though it remains highly significant. This suggests that persons with high combined scores are also likely to have investment income.

Why do the dummy variables representing the provinces have significant coefficients? Table 15 (column 1-A) suggests an answer. All three Prairie provinces have big, negative, and statistically significant coefficients. Could the reason be the different industrial composition of the various provinces? In Table 15 (columns 2-A and 2-B) we omit the dummy variables representing the provinces and replace them with others representing broad industry

groups (the reference group: never worked/permanently unable to work, last worked more than five years ago, and not stated). The fit becomes slightly better, the signs and magnitudes of the new variables are plausible and, on the whole, highly significant.

The information regarding the industry of employment is based on the Statistics Canada Labour Force Survey. It is well known that surveyed persons are giving more reliable information on their occupation than on the classification of industry they are employed in. It is, for instance, easier to identify oneself as a truck driver, than for the employee of a vertically integrated oil company to decide whether one is working in the mining, manufacturing, transportation, or trade industry.

In Table 15 (columns 3-A and 3-B) we replace the type of industry by the type of occupation. Here, again, the coefficients of the newly introduced variables are plausible and highly significant, the fit of the equation further improved, and the coefficient of the combined score reduced but highly significant.

Summary of Canadian-Born Persons

The combined reading and numeracy score has a strong effect on personal income. It does so indirectly by:

- increasing the likelihood of being employed;
- increasing the number of employment weeks per year; and
- permitting employment in well-paying occupations.

It does so directly by providing higher income above and beyond the above-mentioned effects. For instance, persons in the managerial and professional occupations have higher personal incomes than, say, in the clerical or industrial occupations. However, within each of these occupations, persons with higher combined scores have higher personal incomes than persons with lower scores.

Males and Females Born Outside Canada

In Table 16 (columns 1-A and 1-B) we regress the personal income of males and females on their combined reading and numeracy scores. The coefficients are positive and highly significant, and will remain so throughout the regressions to be discussed below (Tables 16 to 19). The size of the coefficients for either sex are lower than the corresponding coefficients of Canadian-born people (Table 13, columns 1-A and 1-B).

As in the case of Canadian-born respondents, the coefficients of the linear and quadratic age variables are significant, the linear one positive, the quadratic negative (Table 16, columns 2-A and 2-B).

The addition of province-of-residence dummies (Table 16, columns 3-A and 3-B) improves the fit of the equations somewhat more than it does in the case of Canadian-born respondents (Table 13, columns 3-A and 3-B).

The introduction of the language of interview (Table 17, columns 1-A and 1-B) seems, at first sight, to contradict the analysis of the Canadian-born respondents (Table 14, columns 1-A and 1-B). However, after the addition of the variables representing industrial or occupational structure, we find certain similarities between Canadian- and foreign-born people. In both instances females who chose French as the language of interview have statistically significant lower personal incomes than those who chose English. In the case of males, the difference is not significant (Table 15, columns 3-A and 3-B, versus Table 19, columns 2-A and 2-B).

As in the case of the Canadian-born, the higher combined reading and numeracy score contributes to obtaining employment and to the avoidance of, or reduction in, spells of unemployment (Table 17, columns 3-A and 3-B).

Foreign- and Canadian-born persons have about equally high investment incomes, but Canadian-born women have more "other income" (scholarships? alimony?) (Table 15, columns 1-A and 1-B; Table 18, columns 1-A and 1-B).

The date of immigration does not have a statistically significant effect on personal income (Table 19, columns 2-A and 2-B), nor is having English or French as one's mother tongue confer the advantage of higher personal income, provided the immigrant started learning English or French before the age of 5. Those who acquired the official languages at a later age have lower incomes (Table 18, columns 3-A and 3-B).

As in the case of the Canadian-born people, replacing the province-of-residence dummies by industry dummies improves the fit for both genders, but particularly for males (compare Table 19, columns 1-A and 1-B, with Table 18, columns 3-A and 3-B). The introduction of occupational dummies (Table 19, columns 2-A and 2-B) improves the fit even further, but here the gain in explanatory power is higher for females than males.

Summary of Persons Born Outside Canada

Our results are very similar to those for Canadian-born persons.

The combined reading and numeracy score has a strong positive effect on personal income. For both genders the size of the coefficient is slightly lower

than that of the Canadian-born respondents. Canadian- as well as foreign-born females who chose French as their language of interview tend to have lower personal incomes than those who chose English. However, only in the case of the Canadian-born females is the difference statistically significant.

Persons with higher combined scores are more likely to find and retain employment and are employed in higher-paying industries or occupations. But, as in the case of the Canadian-born, within each of these industries or occupations, those with higher combined reading and numeracy scores have higher incomes.

Table 1

Reading and numeracy test scores, persons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Reading		1-B Numeracy		2-A Reading	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Constant		274.59	149.13	265.15	125.66	276.12	145.92
Province of birth	British Columbia and Yukon						
Newfoundland		−33.06	−10.63	−32.15	−9.21	−33.09	−10.65
Prince Edward Island		– –	– –	– –	– –	– –	– –
Nova Scotia		−24.16	−8.24	−25.89	−7.70	−24.17	−8.25
New Brunswick		−25.79	−8.42	−26.77	−7.63	−25.57	−8.36
Quebec		−22.50	−11.10	−19.77	−8.51	−22.43	−11.07
Ontario		−8.36	−4.12	−6.48	−2.79	−8.16	−4.03
Manitoba		−8.40	−3.00	−4.26	−1.33	−8.29	−2.97
Saskatchewan		−11.17	−4.30	−7.59	−2.55	−11.16	−4.30
Alberta and Northwest Territories		−6.55	−2.59	−3.47	−1.19	−6.47	−2.55
Gender	Female					−3.27	−3.45
Mover	Stayer						
$\bar{Y}$		259.97		252.46		259.97	
Standard deviation		49.09		60.91		49.09	
Number		8,206		8,206		8,206	
$\bar{R}^2$		0.039		0.033		0.040	

	Reference group	2-B Numeracy		3-A Reading		3-B Numeracy	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		265.52	122.35	274.84	144.83	264.03	121.33
Province of birth	British Columbia and Yukon						
Newfoundland		-32.82	-9.21	-34.32	-11.05	-34.26	-9.62
Prince Edward Island		..	..	..	..	..	..
Nova Scotia		-25.89	-7.70	-25.31	-8.64	-27.23	-8.10
New Brunswick		-26.72	-7.61	-27.01	-8.83	-28.41	-8.09
Quebec		-19.76	-8.50	-21.99	-10.88	-19.25	-8.30
Ontario		-6.43	-2.77	-7.77	-3.84	-5.98	-2.58
Manitoba		-4.23	-1.32	-9.99	-3.57	-6.21	-1.93
Saskatchewan		-7.59	-2.55	-14.29	-5.42	-11.24	-3.72
Alberta and Northwest Territories		-3.44	-1.19	-7.17	-2.84	-4.27	-1.47
Gender	Female	-0.79	-0.73	-3.18	-3.36	-0.70	-0.63
Mover	Stayer			8.62	6.51	11.08	6.64
$\bar{Y}$		252.46		259.97		252.46	
Standard deviation		60.91		49.09		60.91	
Number		8,206		8,206		8,206	
$\bar{R}^2$		0.033		0.045		0.038	

Table 2

Reading and numeracy test scores, persons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Reading		1-B Numeracy		2-A Reading	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		275.72	164.02	267.71	130.36	279.08	156.00
Province of birth	British Columbia and Yukon						
Newfoundland		-25.90	-10.12	-26.05	-8.33	-26.86	-10.76
Prince Edward Island		--	--	--	--	--	--
Nova Scotia		-15.87	-6.57	-18.67	-6.33	-15.37	-6.53
New Brunswick		-18.33	-7.27	-20.21	-6.56	-17.67	-7.19
Quebec		-13.47	-8.06	-10.75	-5.37	-13.18	-8.08
Ontario		-4.61	-2.77	-2.98	-1.46	-4.08	-2.51
Manitoba		-3.98	-1.73	-0.91	-0.32	-2.84	-1.26
Saskatchewan		-6.32	-2.91	-3.83	-1.44	-4.08	-1.92
Alberta and Northwest Territories		-4.15	-2.00	-1.65	0.65	-3.55	-1.75
Gender	Female	-2.80	-3.59	-0.17	-0.18	-3.32	-4.37
Mover	Stayer	4.19	3.84	6.03	4.53	5.60	5.23
Schooling	High-school diploma						
None		-105.73	-10.53	-178.38	-14.54	-96.13	-9.80
Primary only		-63.21	-42.49	-68.16	-37.50	-51.72	-33.15
Some secondary		-20.81	-19.47	-19.75	-15.13	-17.90	-16.93
Some trade/vocational		-4.97	-1.36	-10.60	-2.36	-4.80	-1.34
Trade/vocational diploma		2.86	1.45	3.25	1.35	3.69	1.92
Some community college		10.06	4.94	0.49	0.20	8.22	4.10

Community college diploma		14.18	9.48	8.48	4.64	13.20	9.02
Some university		21.07	11.89	12.60	5.82	20.53	11.80
University diploma below bachelor's degree		11.28	4.12	7.11	2.13	11.44	4.28
Bachelor's degree or above		26.83	18.31	18.29	10.22	26.93	18.77
Age	35-44						
16-24						−1.65	−1.38
25-34						−0.41	−0.37
45-54						−8.61	−6.51
55-69						−23.75	−18.12
Mother immigrated before age 16	All others						
$\bar{Y}$		259.97		252.46		259.97	
Standard deviation		49.09		60.31		49.09	
Number		8,206		8,206		8,206	
$\bar{R}^2$		0.356		0.264		0.387	

Table 2 (concl'd.)

	Reference group	2-B Numeracy		3-A Reading		3-B Numeracy	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		273.29	122.80	278.83	155.70	272.89	122.53
Province of birth	British Columbia and Yukon						
Newfoundland		-26.72	-8.60	-26.56	-10.63	-26.26	-8.45
Prince Edward Island		..	..	..	..	..	..
Nova Scotia		-18.77	-6.41	-15.18	-6.45	-18.48	-6.31
New Brunswick		-20.45	-6.68	-17.59	-7.16	-20.32	-6.64
Quebec		-11.20	-5.52	-12.99	-7.96	-10.91	-5.37
Ontario		-3.05	-1.51	-4.13	-2.54	-3.13	-1.55
Manitoba		-0.71	-0.26	-3.05	-1.36	-1.06	-0.38
Saskatchewan		-3.46	-1.31	-4.29	-2.02	-3.79	-1.43
Alberta and Northwest Territories		-1.39	-0.56	-3.66	-1.80	-1.56	-0.62
Gender	Female	-0.49	-0.52	-3.38	-4.44	-0.58	-0.62
Mover	Stayer	5.76	4.33	5.54	5.18	5.67	4.63
Schooling	High-school diploma						
None		-173.08	-14.18	-96.67	-9.86	-173.93	-14.26
Primary only		-64.35	-33.16	-51.67	-33.13	-64.27	-33.14
Some secondary		-18.31	-13.92	-17.92	-16.96	-18.34	-13.95
Some trade/vocational		-10.14	-2.28	-4.85	-1.35	-10.22	-2.30
Trade/vocational diploma		3.02	1.26	3.68	1.91	3.00	1.26
Some community college		2.41	0.97	8.00	3.98	2.05	0.82
Community college diploma		7.75	4.26	13.25	9.06	7.83	4.30
Some university		14.12	6.52	20.57	11.83	14.19	6.56
University diploma below bachelor's degree		5.91	1.78	11.50	4.30	6.00	1.81

Bachelor's degree or above		17.22	9.64	26.99	18.81	17.30	9.70
Age	35-44						
16-24		−10.75	−7.23	−1.56	−0.30	−10.61	−7.13
25-34		−3.54	−2.57	−0.27	−0.24	−3.32	−2.41
45-54		−2.28	−1.39	−8.83	−6.66	−2.62	−1.59
55-69		−14.41	−8.84	−23.97	−18.26	−14.75	−9.04
Mother immigrated before age 16	All others			4.35	2.71	6.90	3.46
$\overline{Y}$		252.46		259.97		252.46	
Standard deviation		60.91		4.09		60.91	
Number		8,206		8,206		8,206	
$\overline{R}^2$		0.274		0.388		0.275	

Table 3

Reading and numeracy test scores, persons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Reading		1-B Numeracy		2-A Reading	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Constant		281.58	145.51	275.43	114.11	281.63	143.00
Province of birth	British Columbia and Yukon						
Newfoundland		−25.21	−10.10	−25.44	−8.17	−24.29	−9.61
Prince Edward Island		..	..	..	..	..	..
Nova Scotia		−15.05	−6.42	−18.40	−6.29	−16.05	−6.75
New Brunswick		−16.49	−6.74	−19.74	−6.46	−17.89	−7.20
Quebec		−11.99	−7.29	−10.62	−5.18	−12.53	−7.62
Ontario		−3.62	−2.23	−2.87	−1.42	−4.84	−2.96
Manitoba		−1.83	−0.82	−0.07	−0.03	−1.95	−0.87
Saskatchewan		−3.40	−1.61	−3.58	−1.35	−4.43	−2.07
Alberta and Northwest Territories		−3.05	−1.51	−1.26	−0.50	−3.07	−1.52
Gender	Female	−3.03	−4.38	−0.50	−0.53	−3.30	−4.37
Mover	Stayer	5.09	4.76	5.56	4.18	5.15	4.78
Schooling	High-school diploma						
None		−93.95	−9.64	−170.58	−14.03	−93.68	−9.63
Primary only		−49.06	−31.03	−61.81	−31.34	−48.81	−30.86
Some secondary		−16.69	−15.74	−17.08	−12.92	−16.58	−15.66
Some trade/vocational		−5.05	−1.42	−10.31	−2.33	−5.33	−1.50
Trade/vocational diploma		2.93	1.53	2.62	1.10	2.97	1.56
Some community college		7.08	3.54	1.53	0.61	6.81	3.41
Community college diploma		11.74	8.02	6.75	3.70	11.64	7.96
Some university		17.80	10.12	12.33	5.62	17.67	10.06

University diploma below bachelor's degree		9.31	3.49	4.26	1.28	9.69	3.42
Bachelor's degree or above		23.38	15.73	14.63	7.90	23.33	15.69
Age	35-44						
16-24		-4.03	-3.31	-12.36	-8.13	-4.05	-3.33
25-34		-1.33	-1.20	-4.06	-2.94	-1.49	-1.35
45-54		-8.30	-6.30	-2.15	-1.31	-8.62	-6.56
55-69		-22.69	-17.29	-13.32	-8.14	-22.82	-17.42
Mother immigrated before age 16	All others	4.91	3.08	7.44	3.73	5.03	3.16
Highest parental education	High-school diploma						
None		-29.73	-5.02	-34.00	3.73	-29.42	-4.98
Don't know		-12.69	-7.85	-14.61	-7.25	-12.60	-7.81
Primary only		-5.25	-4.50	-3.12	-2.14	-5.09	-4.36
Some secondary		-3.08	-2.45	-2.87	-1.83	-2.90	-2.31
Some trade/vocational		-8.40	-2.39	-5.16	-1.18	-8.47	-2.42
Trade/vocational diploma		2.07	1.10	0.96	0.41	2.13	1.14
Some community college		-0.97	-0.29	-3.81	-0.92	-0.75	-0.23
Community college diploma		3.06	1.64	0.36	0.15	2.99	1.60
Some university		1.19	0.44	-2.19	-0.64	1.54	0.56
University diploma below bachelor's degree		2.85	0.87	4.42	1.08	2.52	0.77
Bachelor's degree or above		6.38	3.70	3.84	1.79	6.55	3.80
Area population	Urban, 500,000 and over						
Urban, 100,000-500,000						5.79	4.58
Urban, 30,000-100,000						2.15	1.67
Urban, less than 30,000						-3.12	-2.64
Rural and Prince Edward Island						0.62	0.58
Academic school program	Not academic						
$\bar{Y}$		259.97		252.46		259.97	
Standard deviation		49.09		60.91		49.09	
Number		8,206		8,206		8,206	
$\bar{R}^2$		0.397		0.281		0.399	

Table 3 (concl'd.)

	Reference group	2-B Numeracy Coefficient	2-B Numeracy t-value	3-A Reading Coefficient	3-A Reading t-value	3-B Numeracy Coefficient	3-B Numeracy t-value
Constant		276.39	112.37	278.80	136.31	274.20	107.24
Province of birth	British Columbia and Yukon						
Newfoundland		-23.80	-7.54	-24.44	-9.69	-23.92	-7.59
Prince Edward Island		..	..	..	..	..	..
Nova Scotia		-18.48	-6.22	-16.25	-6.84	-18.64	-6.28
New Brunswick		-20.01	-6.45	-17.90	-7.33	-20.02	-6.46
Quebec		-11.05	-5.38	-12.52	-7.62	-11.04	-5.38
Ontario		-3.52	-1.73	-4.86	-2.98	-3.54	-1.74
Manitoba		-0.26	-0.09	-1.81	-0.81	-0.15	-0.05
Saskatchewan		-3.75	-1.41	-4.57	-2.14	-3.86	-1.45
Alberta and Northwest Territories		-1.22	-0.48	-2.96	-1.47	-1.14	-0.45
Gender	Female	-0.46	-0.49	-3.28	-4.36	-0.45	-0.48
Mover	Stayer	5.36	3.99	5.13	4.78	5.34	3.98
Schooling	High-school diploma						
None		-170.23	-14.01	-90.94	-9.35	-168.11	-13.82
Primary only		-61.54	-31.15	-48.39	-28.09	-59.66	-28.90
Some secondary		-16.97	-12.83	-14.36	-12.53	-15.25	-10.65
Some trade/vocational		-10.50	-2.37	-4.38	-1.24	-9.77	-2.20
Trade/vocational diploma		2.62	1.10	3.81	1.99	3.27	1.37
Some community college		1.27	0.51	6.40	3.21	0.96	0.38
Community college diploma		6.62	3.62	11.05	7.55	6.17	3.37
Some university		12.09	5.51	16.33	9.20	11.06	4.98
University diploma below bachelor's degree		3.96	1.19	7.54	2.82	2.75	0.82
Bachelor's degree or above		14.43	7.77	21.39	13.95	12.93	6.75

Age	35-44						
16-24		−12.36	−8.13	−4.92	−4.01	−13.02	−8.49
25-34		−4.16	−3.02	−1.51	−1.37	−4.17	−3.02
45-54		−2.33	−1.42	−8.68	−6.61	−2.37	−1.45
55-69		−13.42	−8.20	−22.81	−17.44	−13.41	−8.20
Mother immigrated before age 16	All others	7.48	3.76	4.89	3.07	7.37	3.71
Highest parental education	High-school diploma						
None		−33.67	−4.56	−29.11	−4.93	−33.44	−4.53
Don't know		−14.43	−7.16	−12.18	−7.55	−14.11	−7.00
Primary only		−2.88	−1.98	−4.64	−3.97	−2.53	−1.73
Some secondary		−2.65	−1.69	−2.53	−2.01	−2.37	−1.51
Some trade/vocational		−5.38	−1.23	−8.45	−2.42	−5.37	−1.23
Trade/vocational diploma		1.07	0.46	1.98	1.06	0.96	0.41
Some community college		−3.89	−0.94	−1.04	−0.31	−4.12	−0.99
Community college diploma		0.33	0.14	2.90	1.56	0.26	0.11
Some university		−2.23	−0.66	1.38	0.51	−2.35	−0.69
University diploma below bachelor's degree		4.19	1.03	1.92	0.59	3.73	0.91
Bachelor's degree or above		3.72	1.73	6.12	3.55	3.39	1.57
Area population	Urban, 500,000 and over						
Urban, 100,000-500,000		2.24	1.42	5.81	4.60	2.25	1.43
Urban, 30,000-100,000		0.07	0.04	2.37	1.84	0.24	0.15
Urban, less than 30,000		−4.98	−3.38	−3.01	−2.56	−4.89	−3.32
Rural and Prince Edward Island		1.16	−0.86	0.68	0.63	−1.12	−0.83
Academic school program	Not academic			5.11	5.03	3.95	3.11
$\bar{Y}$		252.46		259.97		252.46	
Standard deviation		60.91		49.09		60.91	
Number		8,206		8,206		8,206	
$\bar{R}^2$		0.282		0.401		0.283	

Table 4

Reading and numeracy test scores, persons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Reading		1-B Numeracy		2-A Reading	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		260.16	138.24	276.33	109.27	242.81	85.29
Province of birth	British Columbia and Yukon						
Newfoundland		−25.63	−10.28	−25.51	−8.20		
Prince Edward Island		..	..	..	..		
Nova Scotia		−17.43	−7.43	−20.22	−6.91		
New Brunswick		−18.45	−7.53	−20.79	−6.80		
Quebec		−12.89	−7.95	−11.73	−5.80		
Ontario		−5.50	−3.42	−4.44	−2.21		
Manitoba		−2.25	−1.02	−0.84	−0.31		
Saskatchewan		−4.81	−2.28	−4.22	−1.61		
Alberta and Northwest Territories		−3.09	−1.55	−1.34	−0.56		
Gender	Female	−3.32	−4.46	−0.52	−0.56	−3.38	−4.52
Mover	Stayer	5.42	5.11	5.74	4.34	7.47	7.26
Schooling	High-school diploma						
None		−76.13	−7.88	−148.87	−12.34	−77.78	−8.00
Primary only		−43.37	−26.39	−55.65	−27.14	−44.24	−26.83
Some secondary		−13.55	−11.95	−14.04	−9.92	−13.86	−12.16
Some trade/vocational		−1.26	−0.36	−5.48	−1.25	−0.75	−0.21
Trade/vocational diploma		3.86	2.04	3.50	1.48	3.57	1.88
Some community college		6.25	3.17	0.78	0.32	5.86	2.96

Community college diploma		10.76	7.44	5.70	3.16	10.42	7.17
Some university		16.26	9.28	11.00	5.03	16.25	9.24
University diploma below bachelor's degree		7.82	2.96	2.90	0.88	7.47	2.81
Bachelor's degree or above		21.26	14.04	12.82	6.78	20.98	13.78
Age	35-44						
16-24		-4.53	-3.74	-12.28	-8.11	-4.54	-3.72
25-34		-1.34	-1.23	-3.88	-2.85	-1.30	-1.19
45-54		-8.97	-6.90	-2.85	-1.76	-8.93	-6.84
55-69		-23.60	-18.13	-14.67	-9.03	-23.01	-17.60
Mother immigrated before age 16	All others	4.48	2.85	6.79	3.46	5.97	8.80
Highest parental education	High-school diploma						
None		-29.85	-5.12	-34.39	-4.73	-28.21	-4.82
Don't know		-12.66	-7.94	-14.89	-7.48	-12.82	-8.01
Primary only		-5.14	-4.45	-3.26	-2.26	-5.49	-4.76
Some secondary		-2.43	-1.96	-2.38	-1.53	-2.13	-1.71
Some trade/vocational		-8.87	-2.57	-6.12	-1.42	-7.14	-2.06
Trade/vocational diploma		1.63	0.89	0.49	0.21	1.76	0.95
Some community college		-1.24	-0.38	-4.60	-1.12	-0.94	-0.28
Community college diploma		2.46	1.34	-0.28	-0.12	2.34	1.27
Some university		2.22	0.83	-1.25	-0.37	1.35	0.50
University diploma below bachelor's degree		1.73	0.54	3.60	0.89	2.35	0.72
Bachelor's degree or above		5.74	3.37	2.72	1.28	5.93	3.47
Area population	Urban, 500,000 and over						
Urban, 100,000-500,000		5.73	4.60	2.05	1.32	4.71	3.88
Urban, 30,000-100,000		2.65	2.09	0.62	0.39	2.17	1.74
Urban, less than 30,000		-2.74	-2.35	-4.66	-3.21	-3.19	-2.79
Rural and Prince Edward Island		1.00	0.94	-0.85	-0.64	0.94	0.90
Academic school program	Not academic	4.53	4.51	3.18	2.53	4.41	4.36
Infirmities	None						
Visual problems before age 16		7.27	2.25	7.89	1.96	8.00	2.46

Table 4 (cont'd.)

	Reference group	1-A Reading		1-B Numeracy		2-A Reading	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Visual problems now		−5.25	−1.76	−7.12	−1.91	−5.40	−1.80
Hearing problems before age 16		1.87	0.70	−5.78	−1.74	1.88	0.70
Hearing problems now		−2.52	−1.12	0.90	0.32	−2.09	−0.92
Speech disability before age 16		4.74	1.52	5.41	1.39	4.44	1.42
Speech disability now		−24.14	−11.53	−33.28	−5.00	−24.01	−4.48
Learning disability before age 16		−15.21	−4.55	−22.02	−5.28	−14.33	−4.27
Learning disability now		−19.20	−4.57	−22.63	−4.32	−19.16	−4.55
Six-month illness before age 16		−0.15	−0.04	−3.20	−0.71	−0.48	−0.13
Six-month illness now		−16.33	−3.73	−18.00	−3.29	−15.97	−3.63
Average personal income						0.29	12.58
$\overline{Y}$		259.97		252.46		259.97	
Standard deviation		49.09		60.91		49.09	
Number		8,206		8,206		8,206	
$\overline{R}^2$		0.417		0.305		0.410	

	Reference group	2-B		3-A*		3-B*	
				Age 16-34		Age 16-34	
		Numeracy		Reading		Numeracy	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		236.23	66.56	278.73	120.43	271.50	43.52
Province of birth	British Columbia and Yukon						
Newfoundland				-24.73	-7.91	-25.15	-6.97
Prince Edward Island				..	..	..	..
Nova Scotia				-17.27	-5.73	-17.48	-5.02
New Brunswick				-17.72	-5.52	-15.80	-4.26
Quebec				-11.84	-5.99	-11.65	-5.10
Ontario				-9.80	-5.05	-5.51	-2.46
Manitoba				-2.85	-1.01	-6.28	-1.92
Saskatchewan				-0.35	-2.24	-5.45	-1.67
Alberta and Northwest Territories				-4.06	-1.71	-2.14	-0.78
Gender	Female	-0.59	-0.64	-4.26	-4.43	-2.60	-2.35
Mover	Stayer	7.70	6.00	3.12	2.18	6.01	3.63
Schooling	High-school diploma						
None		-150.47	-12.42	-29.58	-1.92	-60.41	-3.38
Primary only		-56.54	-27.51	-36.83	-9.26	-42.10	-9.16
Some secondary		-14.40	-10.14	-11.20	-8.08	-10.06	-6.28
Some trade/vocational		-5.23	-1.19	-7.62	-1.89	-7.11	-1.53
Trade/vocational diploma		3.10	1.31	9.09	3.75	8.73	3.12
Some community college		0.55	0.22	5.63	2.81	3.72	1.61
Community college diploma		5.36	2.96	10.78	6.26	7.80	3.93
Some university		10.92	4.98	14.08	7.08	12.55	5.46
University diploma below bachelor's degree		2.44	0.74	5.38	1.41	3.98	0.90

Table A-4 (concl'd.)

	Reference group	2-B		3-A*		3-B*	
		Numeracy		Age 16-34		Age 16-34	
				Reading		Numeracy	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Bachelor's degree or above		12.62	6.65	16.85	8.73	13.18	5.91
Age	35-44						
16-24		-12.23	-8.04	-4.25	-4.08	-9.42	-7.29
25-34		-3.80	-2.78				
45-54		-2.76	-1.70				
55-69		-14.07	-8.64				
Mother immigrated before age 16	All others	8.30	4.24	-1.20	-0.45	2.39	0.78
Highest parental education	High-school diploma						
None		-32.27	4.42	-17.08	-0.81	-21.49	-0.88
Don't know		-14.94	-7.45	-10.64	-4.17	-9.79	-3.33
Primary only		-3.24	-2.25	-8.66	-5.71	-7.26	-4.15
Some secondary		-2.10	-1.35	-3.58	-2.42	-3.27	-1.92
Some trade/vocational		-4.53	-1.05	-3.84	-0.87	-0.25	-0.05
Trade/vocational diploma		0.74	0.32	0.05	0.03	-1.40	-0.59
Some community college		-4.34	-1.06	-7.65	-2.20	-13.19	-3.30
Community college diploma		-0.25	-0.11	2.94	1.41	-0.85	-0.35
Some university		-2.33	-0.69	4.24	1.32	2.04	0.55
University diploma below bachelor's degree		4.18	1.03	2.58	0.73	-0.51	-0.13
Bachelor's degree or above		2.76	1.30	6.01	3.29	2.65	1.26
Area population	Urban, 500,000 and over						
Urban, 100,000-500,000		0.63	0.42	7.76	4.91	-0.44	-0.24
Urban, 30,000-100,000		-0.39	-0.25	4.42	2.70	-0.57	-0.30

Urban, less than 30,000		−5.31	−3.72	−0.09	−0.06	−2.05	−1.17
Rural and Prince Edward Island		−1.50	−1.15	1.20	0.83	−1.74	−1.04
Academic school program	Not academic	2.99	2.38	9.25	7.87	6.53	4.81
Infirmities	None						
Visual problems before age 16		8.61	2.13	11.80	2.61	18.83	3.60
Visual problems now		−7.30	−1.95	−12.52	−2.53	−18.96	−3.32
Hearing problems before age 16		−6.08	−1.82	−4.34	−1.32	−9.28	−2.44
Hearing problems now		1.56	0.56	5.36	1.37	10.63	2.35
Speech disability before age 16		5.18	1.33	8.32	2.50	10.99	2.86
Speech disability now		−33.42	−5.00	−19.99	−3.27	−21.59	−3.06
Learning disability before age 16		−20.98	−5.01	−17.09	−4.28	−22.42	−4.86
Learning disability now		−22.55	−4.29	−23.85	−4.66	−20.10	−3.40
Six-month illness before age 16		−3.73	−0.83	−0.96	−0.19	−16.92	−2.94
Six-month illness now		−17.55	−3.20	−15.21	−2.40	−6.68	−0.91
Average personal income		0.33	11.35				
$\bar{Y}$		252.46		270.23		257.94	
Standard deviation		60.91		36.51		40.14	
Number		8,206		4,208		4,208	
$\bar{R}^2$		0.298		0.292		0.219	

*For these equations the age reference group is 25-34.

Table 5

Reading and numeracy test scores, persons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A*		1-B*		2-A*		2-B*	
		Age 16-34		Age 16-34		Age 16-34		Age 16-34	
		Reading		Numeracy		Reading		Numeracy	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Constant		248.87	59.54	231.61	48.20	248.95	51.74	241.50	43.52
Province of birth	British Columbia and Yukon								
Newfoundland									
Prince Edward Island									
Nova Scotia									
New Brunswick									
Quebec									
Ontario									
Manitoba									
Saskatchewan									
Alberta and Northwest Territories									
Gender	Female	−4.42	−4.57	−2.71	−2.43	−4.31	−4.45	−2.57	−2.30
Mover	Stayer	3.79	2.66	6.81	4.16	3.51	2.47	5.88	3.58
Schooling	High-school diploma								
None		−34.00	−2.19	−63.40	−3.55	−32.19	−2.07	−60.87	−3.39
Primary only		−37.20	−9.29	−42.27	−9.18	−36.86	−9.19	−42.23	−9.12
Some secondary		−12.02	−8.64	−10.63	−6.64	−11.59	−8.31	−10.11	−6.28
Some trade/vocational		−8.05	−1.99	−7.49	−1.61	−7.80	−1.92	−7.32	−1.56

Trade/vocational diploma		8.35	3.43	8.35	2.98	9.10	3.73	9.08	3.22
Some community college		5.30	2.64	3.37	1.46	4.93	2.45	2.95	1.27
Community college diploma		9.75	5.64	6.94	3.49	9.62	5.56	6.77	3.39
Some university		13.87	6.94	12.44	5.41	14.13	7.05	12.60	5.45
University diploma below bachelor's degree		5.55	1.44	3.68	0.83	3.85	1.01	1.40	0.32
Bachelor's degree or above		16.12	8.30	12.59	5.64	15.69	8.08	11.97	5.34
Age	35-44	-4.34	-4.14	-9.53	-7.90	-4.45	-4.24	-9.71	-8.02
16-24									
25-34									
45-54									
55-69									
Mother immigrated before age 16	All others	-0.91	-0.34	2.80	0.91	0.29	0.11	4.63	1.51
Highest parental education	High-school diploma								
None		-12.64	-0.60	-18.12	-0.74	-13.80	-0.65	-19.36	-0.79
Don't know		-11.20	-4.37	-10.50	-3.56	-11.88	-4.63	-11.42	-3.86
Primary only		-9.29	-6.21	-8.09	-4.71	-10.86	-7.26	-10.16	-5.89
Some secondary		-3.83	-2.57	-3.55	-2.07	-4.27	-2.87	-4.30	-2.50
Some trade/vocational		-1.57	-0.35	1.69	0.33	-1.73	-0.39	1.44	0.28
Trade/vocational diploma		0.33	0.16	-1.34	-0.56	-0.11	-0.05	-1.91	-0.80
Some community college		-7.06	-2.02	-12.92	-3.22	-6.75	-1.93	-12.28	-3.05
Community college diploma		2.91	1.39	-0.92	-0.38	2.55	1.21	-1.33	-0.55
Some university		3.74	1.16	1.47	0.40	3.54	1.09	1.17	0.31
University diploma below bachelor's degree		2.48	0.70	-0.46	-0.11	2.61	0.73	-0.24	-0.06
Bachelor's degree or above		6.03	3.27	2.69	1.27	6.28	3.41	3.00	1.41
Area population	Urban, 500,000 and over								
Urban, 100,000-500,000		6.11	4.01	-0.99	-0.57	6.80	4.43	-0.25	-0.14
Urban, 30,000-100,000		3.50	2.18	-1.02	-0.55	3.95	2.44	-0.74	-3.39
Urban, less than 30,000		-1.00	-0.67	-2.42	1.41	-0.53	-0.35	-2.45	-1.40
Rural and Prince Edward Island		0.69	0.48	-1.67	-1.01	0.64	0.44	-2.40	-1.44
Academic school program	Not academic	9.03	7.63	6.38	4.69	9.13	7.70	6.50	4.76

Table 5 (concl'd.)

	Reference group	1-A* Age 16-34 Reading Coefficient	1-A* Age 16-34 Reading t-value	1-B* Age 16-34 Numeracy Coefficient	1-B* Age 16-34 Numeracy t-value	2-A* Age 16-34 Reading Coefficient	2-A* Age 16-34 Reading t-value	2-B* Age 16-34 Numeracy Coefficient	2-B* Age 16-34 Numeracy t-value
Infirmities	None								
Visual problems before age 16		11.89	2.61	18.92	3.61	12.41	2.71	19.75	3.75
Visual problems now		−13.09	−2.63	−19.51	−3.41	−13.42	−2.69	−20.07	−3.49
Hearing problems before age 16		−4.74	−1.43	−9.45	−2.48	−4.39	−1.33	−8.95	−2.34
Hearing problems now		5.77	1.46	10.83	2.39	5.71	1.45	10.73	2.36
Speech disability before age 16		8.30	2.48	10.94	2.85	9.40	2.81	12.48	3.24
Speech disability now		−19.41	−3.16	−20.96	−2.96	−19.74	−3.20	−21.37	−3.01
Learning disability before age 16		−16.04	−3.99	−21.90	−4.74	−16.66	−4.14	−22.59	−4.86
Learning disability now		−24.12	−4.68	−20.33	−3.43	−24.33	−4.71	−20.68	−3.47
Six-month illness before age 16		−0.63	−0.12	−16.80	−2.91	−1.39	−0.28	−17.68	−3.05
Six-month illness now		−13.26	−2.08	−4.85	−0.66	−13.12	−2.06	−4.77	−0.65
Average personal income		0.22	5.86	0.33	7.69				
Average spending per student						21.40	4.96	22.91	4.60
$\bar{Y}$		270.23		257.94		270.23		257.94	
Standard deviation		36.51		40.14		36.51		40.14	
Number		4,208		4,208		4,208		4,208	
$\bar{R}^2$		0.280		0.214		0.279		0.206	

*For these equations the age reference group is 25-34.

Table 6

Effect of province of birth dummies and of average relative personal income on the literacy scores

	(1) Dummies	(2) Income	(3) Difference (1) – (2)	(4) Dummies	(5) Income	(6) Difference (4) – (5)	(7) Expenditure per student	(8) Difference (4) – (7)
	Reading (all age groups)				Reading (age 16-34)			
Newfoundland	–25.6	–15.9	–9.7	–24.7	–9.3	–15.4	–8.3	–16.4
Prince Edward Island	..	..	..	..	..	..	..	..
Nova Scotia	–17.4	–11.5	–5.9	–17.3	–6.7	–10.6	–5.0	–12.3
New Brunswick	–18.5	–13.7	–4.8	–17.7	–7.8	–9.9	–4.7	–13.0
Quebec	–12.9	–7.7	–5.2	–11.8	–3.5	–8.3	2.5	–14.3
Ontario	–5.5	0.4	–5.9	–9.8	1.0	–10.8	0.5	–10.3
Manitoba	–2.2	–6.3	4.1	–2.9	–3.6	0.7	–0.2	–2.7
Saskatchewan	–4.8	–9.6	4.8	–6.4	–4.7	–1.7	–0.7	–5.7
Alberta	–3.1	–4.9	1.8	–4.1	–1.3	–2.8	1.1	–5.2
British Columbia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Numeracy (all age groups)				Numeracy (age 16-34)			
Newfoundland	–25.5	–17.8	–7.7	–25.2	–14.0	–11.2	–8.9	–16.3
Prince Edward Island	..	..	..	..	..	..	..	..
Nova Scotia	–20.2	–12.9	–7.3	–17.5	–10.0	–7.5	–5.3	–12.2
New Brunswick	–20.8	–15.5	–5.3	–15.8	–11.8	–4.0	–5.1	–10.7
Quebec	–11.7	–8.7	–3.0	–11.7	–5.2	–6.5	2.6	–14.3
Ontario	–4.4	0.5	–4.9	–5.5	1.6	–7.1	0.5	–6.0
Manitoba	–0.8	–7.0	6.2	–6.3	–5.4	–0.9	–0.2	–6.1
Saskatchewan	–4.2	–10.8	6.6	–5.4	–7.1	1.7	–0.8	–4.6
Alberta	–1.4	–5.5	4.1	–2.1	–2.0	–0.1	1.2	–3.3
British Columbia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 7

Reading and numeracy test scores, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Reading		1-B Numeracy		2-A Reading	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Constant		272.07	47.40	262.15	29.94	265.80	44.72
Place of birth	United States						
South America		-39.94	-5.33	-43.12	-3.77	-37.95	-5.08
Western Europe		-15.01	-2.03	-2.54	-0.22	-15.27	-2.08
Eastern Europe		-52.57	-6.18	-59.53	-4.58	-52.21	-6.17
Northern Europe		-9.82	-1.46	1.41	0.14	-9.66	-1.45
Southern Europe		-68.39	-9.86	-82.51	-7.80	-68.36	-9.92
Africa		-27.58	-3.03	-30.43	-2.19	-28.69	-3.17
Asia and Oceania		-49.10	-7.38	-57.14	-5.63	-48.23	-7.29
Gender	Female					11.89	3.76
Year of immigration	Before 1950						
Canadian citizen							
1950-59							
1960-69							
1970-79							
1980-89							
Not stated							
$\bar{Y}$		237.30		226.09		237.30	
Standard deviation		56.50		85.50		56.50	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.155		0.132		0.165	

	Reference group	2-B		3-A		3-B	
		Numeracy		Reading		Numeracy	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		259.20	28.42	247.96	32.18	255.52	21.48
Place of birth	United States						
South America		-42.19	-3.68	-37.22	-4.91	-38.34	-3.28
Western Europe		-2.66	-0.24	-13.91	-1.85	2.42	0.21
Eastern Europe		-59.36	-4.57	-47.03	-5.48	-54.52	-4.12
Northern Europe		1.49	0.14	-8.72	-1.31	1.60	0.16
Southern Europe		-82.50	-7.80	-70.98	-10.18	-82.83	-7.69
Africa		-30.95	-2.23	-28.60	-3.13	-27.70	-1.96
Asia and Oceania		-56.73	-5.59	-45.59	-6.60	-49.85	-4.67
Gender	Female	5.58	1.15	12.13	3.89	5.89	1.22
Year of immigration	Before 1950						
Canadian citizen				34.83	2.09	3.48	0.14
1950-59				14.63	2.20	3.30	0.29
1960-69				26.78	4.04	8.83	0.86
1970-79				23.92	3.58	12.16	1.18
1980-89				5.87	0.82	-18.31	-1.66
Not stated				-1.18	-0.05	-18.75	-0.50
$\bar{Y}$		226.09		237.30		226.09	
Standard deviation		85.50		56.50		85.50	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.132		0.187		0.144	

Table 8

Reading and numeracy test scores, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Reading		1-B Numeracy		2-A Reading	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		229.90	26.68	242.79	17.89	207.19	26.40
Place of birth	United States						
South America		-20.86	-2.80	-20.47	-1.74	-22.23	-3.33
Western Europe		-3.49	-0.48	12.76	1.11	-1.95	-0.30
Eastern Europe		-34.69	-4.13	-42.67	-3.23	-24.22	-3.21
Northern Europe		1.62	0.25	11.40	1.11	5.05	0.86
Southern Europe		-54.65	-7.90	-62.47	-5.76	-42.21	-6.76
Africa		-22.99	-2.60	-19.96	-1.43	-17.64	-2.22
Asia and Oceania		-38.50	-5.75	-42.61	-4.04	-34.39	-5.73
Gender	Female	10.12	3.35	2.72	0.57	6.29	2.32
Year of immigration	Before 1950						
Canadian citizen		45.43	2.77	9.30	0.36	68.47	4.64
1950-59		18.45	2.85	-3.99	-0.39	19.58	3.37
1960-69		26.12	4.02	3.99	0.39	23.94	4.11
1970-79		23.00	3.46	4.98	0.48	23.93	4.02
1980-89		10.26	1.41	-21.62	-1.89	19.13	2.92
Not stated		7.37	0.31	-15.58	-0.41	19.85	0.92
Schooling before immigration	High-school diploma						
None		26.58	4.97	18.49	2.20	2.92	0.58
Primary only		-5.70	-1.16	9.98	-1.30	-14.98	-3.39

Some secondary		−7.32	1.25	−2.58	−0.28	−8.04	−1.53
Some trade/vocational		−25.68	−1.92	−54.94	−3.09	−24.10	−2.38
Trade/vocational diploma		−10.95	−1.37	−9.14	−0.12	−15.34	−2.14
Some community college		−2.19	−0.20	7.00	0.41	−10.04	−1.04
Community college diploma		17.16	2.49	29.07	2.59	18.72	2.93
Some university		23.95	2.89	33.44	2.56	24.99	3.37
University diploma below bachelor's degree		27.01	2.79	39.09	2.57	23.92	2.76
Bachelor's degree or above		40.33	6.22	48.30	4.73	36.69	6.31
Other		−17.95	−0.61	−38.49	−0.48	−5.92	−0.23
Not stated		−3.48	−0.32	−5.15	−0.30	−0.59	−0.06
Credits in Canada	No credits					48.11	16.26
Schooling in Canada	High-school diploma						
Primary only							
Some secondary							
Some trade/vocational							
Trade/vocational diploma							
Some community college							
Community college diploma							
Some university							
University diploma below bachelor's degree							
Bachelor's degree or above							
Other							
Not stated							
$\bar{Y}$		237.30		226.09		237.30	
Standard deviation		56.50		85.50		56.50	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.258		0.187		0.404	

Table 8 (concl'd.)

	Reference group	2-B Numeracy		3-A Reading		3-B Numeracy	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		213.62	16.11	214.31	28.09	220.96	17.16
Place of birth	United States						
South America		-22.22	-2.03	-26.27	-4.00	-29.88	-2.70
Western Europe		14.73	1.37	-5.35	-0.84	8.30	0.77
Eastern Europe		-29.22	-2.36	-26.58	-3.64	-32.70	-2.66
Northern Europe		15.80	1.64	3.03	0.53	11.45	1.19
Southern Europe		-46.78	-4.57	-42.11	-6.96	-49.10	-4.81
Africa		-13.08	-1.01	-22.75	-2.95	-20.44	-1.57
Asia and Oceania		-37.33	-3.80	-37.84	-6.46	-41.76	-4.22
Gender	Female	-2.20	-0.49	4.41	1.67	-3.50	-0.79
Year of immigration	Before 1950						
Canadian citizen		38.90	1.61	64.80	4.56	37.09	1.56
1950-59		-2.54	-0.27	14.22	2.51	-5.40	-0.56
1960-69		1.18	0.12	17.35	3.04	-3.00	-0.31
1970-79		6.16	0.63	21.14	3.64	4.21	0.43
1980-89		-10.24	-0.96	16.57	2.59	-11.95	-1.11
Not stated		0.45	0.01	16.58	0.80	-1.88	-0.05
Schooling before immigration	High-school diploma						
None		-11.90	-1.45	2.68	0.55	-12.51	-1.51
Primary only		-21.90	-3.02	-13.06	-3.02	-20.35	-2.79
Some secondary		-3.50	-0.40	-9.60	-1.89	-4.01	-0.47
Some trade/vocational		-58.05	-3.50	-13.87	-1.39	-42.62	-2.53
Trade/vocational diploma		-14.79	-1.26	-12.15	-1.74	-10.48	-0.89
Some community college		-3.07	-0.19	-11.12	-1.17	-6.55	-0.41

Community college diploma		30.30	2.90	18.47	2.99	29.31	2.81
Some university		34.78	2.86	23.93	3.32	33.88	2.78
University diploma below bachelor's degree		35.13	2.47	23.49	2.78	33.67	2.36
Bachelor's degree or above		43.62	4.58	30.93	5.47	38.88	4.07
Other		-23.05	-0.54	-1.66	-0.07	-18.79	-0.44
Not stated		-1.44	-0.09	7.93	0.80	8.97	0.54
Credits in Canada	No credits	61.78	12.74	42.94	7.48	59.74	6.17
Schooling in Canada	High-school diploma						
Primary only				-18.49	-1.59	-19.15	-0.98
Some secondary				-3.07	-0.41	-3.70	-0.30
Some trade/vocational				-33.30	-3.47	-54.44	-3.36
Trade/vocational diploma				-18.49	-1.59	-3.40	-0.23
Some community college				9.71	1.25	14.99	1.14
Community college diploma				7.97	1.12	7.80	0.65
Some university				2.50	0.30	2.52	0.18
University diploma below bachelor's degree				6.14	0.41	-9.98	-0.39
Bachelor's degree or above				32.05	4.92	19.36	1.76
Other				-19.22	-2.09	-27.84	-1.79
Not stated							
$\bar{Y}$		226.09		227.30		226.09	
Standard deviation		85.50		56.50		85.50	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.293		0.450		0.308	

Table 9

Reading and numeracy test scores, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Reading		1-B Numeracy		2-A Reading	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		215.42	28.37	221.41	17.18	217.58	28.85
Place of birth	United States						
South America		-28.59	-4.36	-30.82	-2.77	-22.62	-3.41
Western Europe		-5.20	-0.82	8.36	0.78	4.98	0.74
Eastern Europe		-26.42	-3.64	-32.64	-2.65	-11.32	-1.43
Northern Europe		3.37	0.60	11.59	1.20	3.72	0.66
Southern Europe		-40.70	-6.75	-48.52	-4.74	-25.66	-3.74
Africa		-23.63	-3.08	-20.79	-1.60	-14.33	-1.82
Asia and Oceania		-38.11	-6.54	-41.88	-4.24	-24.25	-3.70
Gender	Female	4.09	1.56	-3.63	-0.82	4.21	1.62
Year of immigration	Before 1950						
Canadian citizen		56.66	3.96	33.80	1.39	49.98	3.35
1950-59		13.47	2.39	-5.70	-0.60	15.57	2.78
1960-69		6.37	2.88	-3.40	-0.35	16.11	2.86
1970-79		19.49	3.37	3.55	0.36	19.17	3.34
1980-89		14.88	2.33	-12.63	-1.17	16.15	2.55
Not stated		16.59	0.80	-1.87	-0.05	15.20	0.74
Schooling before immigration	High-school diploma						
None		1.30	0.26	-13.07	-1.57	1.12	0.23
Primary only		-13.16	-3.06	-20.39	-2.80	-13.33	-3.13
Some secondary		-10.11	-2.00	-4.22	-0.49	-9.58	-1.91
Some trade/vocational		-11.85	-1.19	-41.81	-2.47	-11.31	-1.15

Trade/vocational diploma		−10.19	−1.46	−9.69	−0.82	−10.32	−1.49
Some community college		−8.17	−0.86	−5.36	−0.33	−9.76	−1.04
Community college diploma		19.19	3.12	29.60	2.84	19.27	3.17
Some university		25.72	3.58	34.60	2.84	26.56	3.73
University diploma below bachelor's degree		23.47	2.79	33.66	2.36	21.95	2.63
Bachelor's degree or above		30.85	5.48	38.85	4.07	30.71	5.51
Other		−1.50	−0.06	−18.72	−0.47	−9.11	−0.36
Not stated		7.51	0.77	8.80	0.53	4.86	0.50
Credits in Canada	No credits	37.04	6.24	57.36	5.70	36.02	6.12
Schooling in Canada	High-school diploma						
Primary only		−12.99	−1.11	−16.93	−0.86	−12.89	−1.12
Some secondary		−2.72	−0.30	−3.34	−0.27	−2.72	−0.37
Some trade/vocational		−34.12	−3.57	−54.78	−3.38	−33.03	−3.49
Trade/vocational diploma		−19.16	−2.24	−3.80	−0.26	−17.79	−2.09
Some community college		7.21	0.93	13.98	1.06	6.53	0.85
Community college diploma		3.52	0.49	6.00	0.49	2.86	0.40
Some university		−5.34	−0.63	−0.65	−0.04	−4.89	−0.58
University diploma below bachelor's degree		1.38	0.09	−11.91	−0.47	3.75	0.25
Bachelor's degree or above		22.52	3.22	15.51	1.31	21.51	3.10
Not stated		−14.79	−1.60	−26.05	−1.66	−13.84	−1.51
Academic school program	Not academic	16.32	3.62	6.60	0.86	15.91	3.56
First language not English nor French	English or French					−17.68	−4.48
Age starting English or French	0-4						
5-10							
11-15							
16-20							
21 and over							
Never							
Not stated							
$\bar{Y}$		237.30		226.09		237.30	
Standard deviation		56.50		85.50		56.50	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.456		0.308		0.465	

Table 9 (concl'd.)

	Reference group	2-B Numeracy		3-A Reading		3-B Numeracy	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		223.56	17.36	227.45	32.94	237.61	20.24
Place of birth	United States						
South America		-24.86	-2.20	-21.96	-3.66	-24.30	-2.38
Western Europe		18.52	1.62	5.94	0.98	20.72	2.00
Eastern Europe		-17.58	-1.30	5.01	0.69	6.63	0.53
Northern Europe		11.94	1.24	0.50	0.10	7.96	0.92
Southern Europe		-33.52	-2.86	-17.71	-2.84	-20.69	-1.95
Africa		-11.52	-0.86	-14.35	-2.00	-12.51	-1.03
Asia and Oceania		-28.05	-2.51	-25.17	-4.20	-30.50	-3.00
Gender	Female	-3.50	-0.79	5.43	2.30	-1.19	-0.30
Year of immigration	Before 1950						
Canadian citizen		25.13	1.03	37.76	2.90	9.32	0.42
1950-59		-3.60	-0.38	19.48	3.81	2.52	0.29
1960-69		-3.65	-0.38	21.31	4.16	4.13	0.47
1970-79		3.23	0.33	19.15	3.68	4.49	0.51
1980-89		-11.37	-1.05	21.30	3.69	-2.09	-0.21
Not stated		-3.27	-0.09	20.48	1.10	6.37	0.20
Schooling before immigration	High-school diploma						
None		-13.24	-1.60	0.10	0.02	-12.81	-1.63
Primary only		-20.56	-2.83	-9.49	-2.41	-13.32	-1.99
Some secondary		-3.69	-0.43	-12.87	-2.81	-8.24	-1.06
Some trade/vocational		-41.27	-2.45	-5.94	-0.65	-31.88	-2.04
Trade/vocational diploma		-9.82	-0.83	-16.54	-2.61	-21.06	-1.96
Some community college		-6.95	-0.43	-7.43	-0.87	-2.98	-0.21
Community college diploma		29.68	2.86	18.80	3.38	30.82	3.21

Some university		35.44	2.91	26.68	4.13	33.98	3.09
University diploma below bachelor's degree		32.14	2.26	16.62	2.18	21.16	1.63
Bachelor's degree or above		38.72	4.07	24.23	4.76	30.47	3.52
Other		−26.32	−0.62	−3.28	−0.14	−18.71	−0.49
Not stated		6.16	0.38	1.70	0.19	1.22	0.08
Credits in Canada	No credits	56.34	5.61	19.42	3.56	28.22	3.03
Schooling in Canada	High-school diploma						
Primary only		−16.88	−0.85	−17.01	−1.62	−21.49	−1.20
Some secondary		−3.88	−0.31	−2.08	−0.31	−3.30	−0.29
Some trade/vocational		−53.69	−3.32	−20.47	−2.36	−35.28	−2.40
Trade/vocational diploma		−2.43	−0.17	−13.94	−1.81	3.45	0.26
Some community college		13.30	1.01	7.09	1.00	15.11	1.27
Community college diploma		5.34	0.44	7.85	1.21	12.17	1.10
Some university		−0.20	−0.01	−0.58	−0.08	7.17	0.55
University diploma below bachelor's degree		−9.55	−0.37	8.42	0.62	−4.76	−0.21
Bachelor's degree or above		14.50	1.22	22.04	3.49	14.37	1.34
Not stated		−25.11	−1.60	−10.88	−1.30	23.16	−1.63
Academic school program	Not academic	6.20	0.81	13.85	3.39	4.48	0.64
First language not English nor French	English or French	−17.64	−2.62	5.08	0.96	8.50	0.94
Age starting English or French	0-4						
5-10				−14.19	−2.62	−3.35	−0.36
11-15				−15.63	−2.57	−19.54	−1.89
16-20				−51.38	−7.36	−69.85	−5.89
21 and over				−63.53	−10.57	−86.28	−8.45
Never				−106.59	−9.20	−209.76	−10.65
Not stated				−42.96	−2.42	−96.41	−3.19
$\bar{Y}$		226.09		237.30		226.09	
Standard deviation		85.50		56.50		85.50	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.312		0.561		0.440	

Table 10

Reading and numeracy test scores, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Reading		1-B Numeracy		2-A Reading	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		256.50	31.73	291.08	21.22	257.38	30.82
Place of birth	United States						
South America		-20.74	-3.52	-21.89	-2.19	-18.79	-3.23
Western Europe		6.72	1.13	21.61	2.14	6.29	1.07
Eastern Europe		5.55	0.77	6.19	0.51	4.13	0.58
Northern Europe		2.11	0.42	10.32	1.21	3.50	0.70
Southern Europe		-18.63	-3.05	-22.92	-2.21	-16.11	-2.67
Africa		-9.71	-1.37	-5.70	-0.47	-8.24	-1.19
Asia and Oceania		-23.32	-3.97	-27.68	-2.78	-22.97	-3.98
Gender	Female	5.33	2.29	-1.93	-0.49	6.66	2.90
Year of immigration	Before 1950						
Canadian citizen		6.34	0.45	-51.82	-2.18	12.66	0.92
1950-59		10.07	1.93	-15.14	-1.71	8.16	1.58
1960-69		7.46	1.31	-22.74	-2.36	3.75	0.67
1970-79		-3.64	-0.54	-39.48	-3.63	-3.53	-0.55
1980-89		-5.30	-0.73	-52.93	-4.30	-4.31	-0.60
Not stated		3.70	0.20	-25.52	-0.82	-0.20	-0.01
Schooling before immigration	High-school diploma						
None		-8.74	-1.78	-30.77	-3.69	-5.54	-1.14
Primary only		-14.83	-3.70	-23.99	-3.53	-11.93	-2.99
Some secondary		-16.09	-3.51	-15.19	-1.96	-14.85	-3.27

Some trade/vocational		−5.34	−0.59	−30.51	−1.98	−6.72	−0.75
Trade/vocational diploma		−14.93	−2.40	−17.71	−1.68	−16.88	−2.72
Some community college		−4.02	−0.48	3.26	0.23	−5.64	−0.68
Community college diploma		17.43	3.18	28.96	3.12	16.04	2.97
Some university		29.03	4.57	38.53	3.58	25.48	4.08
University diploma below bachelor's degree		19.24	2.57	25.84	2.04	17.83	2.38
Bachelor's degree or above		27.55	5.48	37.36	4.38	26.03	5.17
Other		−1.67	−0.08	−15.85	−0.42	−0.31	−0.01
Not stated		−7.18	−0.82	−14.08	−0.95	−7.78	−0.89
Credits in Canada	No credits	13.35	2.46	17.20	1.87	10.30	1.93
Schooling in Canada	High-school diploma						
Primary only		−17.07	−1.65	−21.50	−1.23	−13.94	−1.38
Some secondary		−0.50	−0.08	−3.70	−0.33	−0.37	−0.06
Some trade/vocational		−14.29	−1.67	−25.36	−1.74	−12.72	−1.49
Trade/vocational diploma		−13.14	−1.74	5.53	0.43	−11.45	−1.54
Some community college		9.56	1.39	19.65	1.68	12.59	1.84
Community college diploma		7.42	1.16	13.53	1.24	10.27	1.62
Some university		0.38	0.05	7.56	0.59	4.14	0.56
University diploma below bachelor's degree		13.90	1.04	3.46	0.15	14.44	1.11
Bachelor's degree or above		20.04	3.20	13.28	1.25	18.91	3.06
Not stated		−3.88	−0.47	−12.12	−0.86	−6.43	−0.78
Academic school program	Not academic	13.16	3.22	1.13	0.16	11.02	2.71
First language not English nor French	English or French	4.13	0.79	7.04	0.80	2.88	0.56
Age starting English or French	0-4						
5-10		−12.68	−2.38	−0.61	−0.07	−10.32	−1.94
11-15		−12.23	−2.04	−13.51	−1.33	−9.22	−1.54
16-20		−50.47	−7.37	−68.19	−5.87	−47.67	−7.04
21 and over		−57.97	−9.73	−75.85	−7.51	−54.30	−9.20
Never		−85.86	−7.26	−170.81	−8.52	−78.84	−6.80
Not stated		−39.65	−2.27	−89.61	−3.03	−25.53	−1.48
Age at interview	35-44						
16-24		3.34	0.66	18.10	2.12	−0.78	−0.15
25-34		1.13	0.31	2.92	0.47	0.88	0.24

Table 10 (cont'd.)

	Reference group	1-A Reading Coefficient	1-A Reading t-value	2-B Numeracy Coefficient	2-B Numeracy t-value	3-A Reading Coefficient	3-A Reading t-value
45-54		-20.92	-5.60	-34.30	-5.41	-20.18	-5.49
55-69		-23.54	-5.75	-41.07	-5.92	-21.89	-5.43
Highest parental schooling	High-school diploma						
No schooling						-27.11	-3.91
Don't know						-20.78	-4.67
Primary only						-0.69	-0.19
Some secondary						-1.59	-0.38
Some trade/vocational						13.37	1.34
Trade/vocational diploma						3.69	0.56
Some community college						1.89	0.18
Community college diploma						6.62	1.07
Some university						23.19	2.56
University diploma below bachelor's degree						-9.12	-1.16
Bachelor's degree and above						8.42	1.99
Area population	Urban, 500,000 and over						
Urban, 100,000-500,000							
Urban, 30,000-100,000							
Urban, 30,000 or less							
Rural and Prince Edward Island							
$\bar{Y}$		237.30		226.09		237.30	
Standard deviation		56.50		85.50		56.50	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.579		0.465		0.599	

	Reference group	2-B Numeracy		3-A Reading		3-B Numeracy	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Constant		291.83	20.47	253.47	29.43	290.06	19.68
Place of birth	United States						
South America		−17.68	−1.78	−16.31	−2.75	−16.89	−1.66
Western Europe		20.80	2.08	6.64	1.13	21.12	2.10
Eastern Europe		4.85	0.40	4.68	0.66	5.79	0.48
Northern Europe		11.37	1.34	4.56	0.91	12.13	1.42
Southern Europe		−22.73	−2.21	−14.20	−2.30	−21.56	−2.05
Africa		−3.37	−0.28	−5.77	−0.82	−2.25	−0.19
Asia and Oceania		−25.37	−2.57	−20.44	−3.46	−24.42	−2.42
Gender	Female	−0.41	−0.10	6.74	2.94	−0.46	−0.12
Year of immigration	Before 1950						
Canadian citizen		−41.44	−1.76	13.67	0.99	−41.46	−1.76
1950-59		−16.88	−1.92	8.22	1.59	−16.69	−1.89
1960-69		−26.93	−2.80	4.48	0.79	−26.38	−2.72
1970-79		−40.37	−3.71	−3.22	−0.50	−39.92	−3.64
1980-89		−53.43	−4.37	−4.08	−0.57	−53.00	−4.31
Not stated		−30.89	−1.00	−0.18	−0.01	−30.22	−0.98
Schooling before immigration	High-school diploma						
None		−25.83	−3.10	−5.06	−1.04	−25.98	−3.11
Primary only		−20.20	−2.96	−11.68	−2.94	−20.18	−2.95
Some secondary		−13.47	−1.74	−13.88	−3.05	−13.61	−1.75
Some trade/vocational		−34.68	−2.27	−5.83	−0.65	−36.10	−2.34
Trade/vocational diploma		−13.71	−1.30	−15.37	−2.47	−13.63	−1.28
Some community college		2.30	0.16	−4.77	−0.58	2.50	0.18
Community college diploma		28.60	3.10	16.58	3.07	28.85	3.12

Table 10 (concl'd.)

	Reference group	2-B Numeracy		3-A Reading		3-B Numeracy	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Some university		35.59	3.34	26.46	4.22	36.12	3.37
University diploma below bachelor's degree		27.54	2.15	18.12	2.42	27.94	2.18
Bachelor's degree or above		38.66	4.50	26.87	5.33	38.73	4.48
Other		-6.16	-0.16	-2.80	-0.13	-7.47	-0.20
Not stated		-11.57	-0.78	-7.01	-0.80	-11.43	-0.76
Credits in Canada	No credits	14.17	1.55	11.29	2.10	14.72	1.60
Schooling in Canada	High-school diploma						
Primary only		-20.90	-1.21	-18.19	-1.77	-22.47	-1.28
Some secondary		-6.63	-0.59	-1.89	-0.28	-6.83	0.60
Some trade/vocational		-24.32	-1.67	-13.81	-1.62	-24.22	-1.66
Trade/vocational diploma		7.47	0.59	-12.89	-1.73	7.06	0.52
Some community college		24.93	2.14	12.15	1.78	24.84	2.12
Community college diploma		14.21	1.31	9.57	1.51	13.73	1.26
Some university		11.28	0.89	3.02	0.40	10.91	0.85
University diploma below bachelor's degree		2.71	0.12	13.40	1.03	1.73	0.08
Bachelor's degree or above		10.78	1.02	18.42	2.98	10.56	1.00
Not stated		-15.92	-1.14	-6.77	-0.82	-16.15	-1.15
Academic school program	Not academic	0.24	0.04	11.27	2.77	0.38	0.05
First language not English nor French	English or French	7.77	0.88	3.09	0.60	7.52	0.85
Age starting English or French	0-4						
5-10		-1.61	-0.18	-10.81	-2.03	-1.12	-0.12
11-15		-13.45	-1.32	-9.47	-1.58	-13.44	-1.31
16-20		-69.48	-6.01	-47.86	-7.07	-69.21	-5.97
21 and over		-74.23	-7.37	-53.99	-9.15	-73.98	-7.32
Never		-163.18	-8.24	-78.70	-6.73	-162.38	-8.18
Not stated		-74.23	-2.52	-24.62	-1.43	-73.59	-2.49

Age at interview	35-44	17.41	2.02	-0.34	-0.07	17.16	1.97
16-24		2.95	0.48	0.77	0.21	3.01	0.48
25-34		-34.28	-5.46	-19.85	-5.40	-34.22	-5.44
45-54		-39.66	-5.77	-21.34	-5.28	-39.46	-5.70
55-69							
Highest parental schooling	High-school						
No schooling	diploma	-39.13	-3.31	-26.86	-3.87	-39.70	-3.34
Don't know		-27.23	-3.58	-20.75	-4.66	-27.03	-3.55
Primary only		6.46	1.05	-0.84	-0.23	6.34	1.03
Some secondary		0.21	0.03	-1.74	-0.41	0.23	0.03
Some trade/vocational		32.92	1.94	13.28	1.34	32.97	1.94
Trade/vocational diploma		-21.07	-1.88	3.10	0.47	-21.15	-1.88
Some community college		6.51	0.35	1.92	0.18	6.39	0.35
Community college diploma		8.20	0.78	6.08	0.98	8.14	0.77
Some university		26.81	1.74	24.14	2.66	26.76	1.72
University diploma below bachelor's degree		-16.52	-1.22	-8.39	-1.06	-16.58	-1.23
Bachelor's degree and above		0.30	0.04	8.35	1.97	0.46	0.06
Area population	Urban, 500,000						
Urban, 100,000-500,000	and over			3.14	0.79	-1.79	-0.26
Urban, 30,000-100,000				-2.31	-0.51	4.79	0.62
Urban, 30,000 or less				4.82	0.91	-0.27	-0.03
Rural and Prince Edward Island				0.11	2.24	3.46	0.45
$\bar{Y}$		226.09		237.30		226.09	
Standard deviation		85.50		56.50		85.50	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.484		0.600		0.482	

Table 11

Reading and numeracy test scores, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Reading		1-B Numeracy	
		Coefficient	t-value	Coefficient	t-value
Constant		254.17	29.54	290.22	19.77
Place of birth	United States				
South America		-17.06	-2.88	-18.16	-1.80
Western Europe		7.43	1.26	22.12	2.20
Eastern Europe		4.09	0.57	5.63	0.46
Northern Europe		4.28	0.85	11.06	1.29
Southern Europe		-14.04	-2.27	-21.65	-2.06
Africa		-5.30	-0.75	-1.92	-0.16
Asia and Oceania		-20.68	-3.50	-25.49	-2.53
Gender	Female	6.77	2.93	-0.31	-0.08
Year of immigration	Before 1950				
Canadian citizen		15.91	1.12	-37.14	-1.54
1950-59		7.91	1.53	-16.38	-1.86
1960-69		4.22	0.74	-25.62	-2.65
1970-79		-2.92	-0.45	-37.82	-3.46
1980-89		-3.60	-0.50	-50.54	-4.13
Not stated		-3.36	-0.18	-29.51	-0.95
Schooling before immigration	High-school diploma				
None		-5.38	-1.10	-26.13	-3.14
Primary only		-11.95	-3.00	-20.09	-2.95
Some secondary		-14.10	-3.08	-12.84	-1.65
Some trade/vocational		-6.20	-0.69	-37.72	-2.46

Trade/vocational diploma		−14.56	−2.34	−12.48	−1.17
Some community college		−5.21	−0.64	1.68	0.12
Community college diploma		14.27	2.63	25.56	2.76
Some university		25.89	4.14	35.15	3.30
University diploma below bachelor's degree		17.21	2.30	25.88	2.03
Bachelor's degree or above		24.71	4.88	34.19	3.96
Other		−3.12	−0.14	−0.69	−0.02
Not stated		−10.38	−1.18	−17.79	−1.18
Credits in Canada	No credits	12.59	2.34	17.57	1.91
Schooling in Canada	High-school diploma				
Primary only		−17.89	−1.71	−26.18	−1.47
Some secondary		−2.87	−0.43	−8.96	−0.79
Some trade/vocational		−15.48	−1.80	−28.85	−1.97
Trade/vocational diploma		−13.58	−1.82	5.00	0.39
Some community college		11.08	1.62	22.51	1.94
Community college diploma		8.85	1.40	11.60	1.07
Some university		2.14	0.29	9.46	0.75
University diploma below bachelor's degree		14.38	1.10	3.09	0.14
Bachelor's degree or above		17.57	2.85	9,00	0.86
Not stated		−5.14	−0.60	−11.68	−0.81
Academic school program	Not academic	11.16	2.75	0.22	0.03
First language not English nor French	English or French	3.23	0.63	8.31	0.95
Age starting English or French	0-4				
5-10		−11.70	−2.19	−2.08	−0.22
11-15		−10.58	−1.76	−15.41	−1.50
16-20		−47.96	−7.09	−68.82	−5.97
21 and over		−54.25	−9.19	−74.06	−7.36
Never		−79.13	−6.83	−164.88	−8.34
Not stated		−23.85	−1.38	−73.45	−2.50
Age at interview	35-44				
16-24		−1.43	−0.28	14.60	1.69
25-34		0.19	0.05	1.21	0.20

Table 11 (concl'd.)

	Reference group	1-A Reading		1-B Numeracy	
		Coefficient	t-value	Coefficient	t-value
45-54		-20.14	-5.44	-35.17	-5.57
55-69		-20.53	-5.00	-35.93	-5.13
Highest parental schooling	High-school diploma				
No schooling		-29.36	-4.07	-44.03	-3.58
Don't know		-20.57	-4.62	-22.12	-3.58
Primary only		-1.00	-0.28	5.21	0.84
Some secondary		-2.78	-0.67	-2.66	-0.37
Some trade/vocational		14.92	1.50	35.07	2.07
Trade/vocational diploma		3.73	0.57	-20.38	-1.82
Some community college		1.86	0.17	5.74	0.31
Community college diploma		6.71	1.08	8.17	0.77
Some university		20.87	2.25	19.65	1.24
University diploma below bachelor's degree		-5.98	-0.76	-12.14	-0.90
Bachelor's degree or above		8.41	1.99	0.12	0.02
Area population	Urban, 500,000 and over				
Urban, 100,000-500,000		3.58	0.90	-1.51	-0.22
Urban, 30,000-100,000		-0.85	-0.18	7.01	0.90
Urban, 30,000 or less		4.99	0.93	-0.21	-0.02
Rural and Prince Edward Island		10.76	2.37	4.15	0.54
Infirmities	None				
Visual problems before age 16		-26.40	-2.22	-28.49	-1.40
Visual problems now		16.93	1.93	13.88	0.93
Hearing problems before age 16		1.65	0.14	19.60	0.97
Hearing problems now		-19.35	-2.43	-45.71	-3.36
Speech disability before age 16		-20.56	-0.96	-18.17	-0.51

Speech disability now	31.63	1.22	30.65	0.69
Learning disability before age 16	10.28	0.42	70.44	1.68
Learning disability now	−15.70	−0.67	−90.08	−2.32
Six-month illness before age 16	15.34	1.20	51.34	2.36
Six-month illness now	8.03	0.06	−1.45	−0.07
$\overline{Y}$	237.30		226.09	
Standard deviation	56.50		85.50	
Number	1,102		1,102	
$\overline{R}^2$	0.603		0.490	

Table 12

Statistics Canada literacy survey, level of children's education, persons aged 25-44, Canada, 1989

Based on weighted counts

	Postsecondary		Secondary		Primary	
	Male	Female	Male	Female	Male	Female
			(All surveyed persons)			
Level of parent's education:						
Father						
Postsecondary	80.9	72.6	18.7Q	24.7Q	--	--
Secondary	48.2	47.4	47.7	50.3	--	--
Primary	26.2	25.7	65.2	65.0	8.6Q	9.3Q
Mother						
Postsecondary	71.4	67.5	26.2	27.9	--	--
Secondary	50.0	47.6	47.6	48.7	--	--
Primary	26.8	24.4	63.5	65.8	9.7Q	9.9Q
			(Born in Canada)			
Father						
Postsecondary	77.9	74.1	22.1Q	22.9Q	--	--
Secondary	46.7	44.3	51.8	54.7	--	--
Primary	22.4	26.2	70.0	67.2	7.6Q	--
Mother						
Postsecondary	66.7	65.8	33.0	30.0Q	--	--
Secondary	47.3	47.5	50.1	51.4	--	--
Primary	21.9	23.3	70.3	69.4	7.8Q	7.3Q

				(Born outside Canada)		
Father						
Postsecondary	90.6	68.5	--	29.7Q	--	--
Secondary	59.8	60.4	28.5Q	31.8Q	--	--
Primary	50.8	22.9Q	34.1Q	53.5	--	23.7Q
Mother						
Postsecondary	88.1	71.7	--	--	--	--
Secondary	67.7	60.4	31.8Q	31.9Q	--	--
Primary	50.4	28.5Q	30.8Q	51.9	--	19.6Q

Q Qualified because of high sampling variability.
-- Not releasable because of high sampling variability.

Table 13

Personal incom... ...ersons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Males		1-B Females		2-A Males	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		–3,068.22	–1.89	–7,997.25	–7.12	–63,512.00	–26.10
Reading and numeracy score		57.76	18.42	42.84	19.90	57.04	19.59
Age						3,026.85	26.80
$(Age)^2$						–32.97	–23.90
Province of residence	British Columbia						
Newfoundland							
Prince Edward Island							
Nova Scotia							
New Brunswick							
Quebec							
Ontario							
Manitoba							
Saskatchewan							
Alberta							
$\bar{Y}$		26,417		14,042		26,417	
Standard deviation		17,617		13,176		17,617	
Number		3,646		4,600		3,646	
$\bar{R}^2$		0.085		0.079		0.278	

	Reference group	2-B Females		3-A Males		3-B Females	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		–33,801.00	–18.77	–62,390.00	–24.18	–33,210.00	–17.44
Reading and numeracy score		39.35	17.62	55.47	18.65	36.56	15.95
Age		1,451.58	17.70	3,030.48	26.84	–1,480.50	18.08
$(Age)^2$		–16.71	–16.72	–33.02	–23.97	–17.10	–17.12
Province of residence	British Columbia						
Newfoundland				–2,739.53	–1.57	–1,493.04	–1.20
Prince Edward Island				– –	– –	– –	– –
Nova Scotia				2,438.38	–1.57	–1,307.26	–1.25
New Brunswick				–3,817.10	–2.36	–858.69	–0.75
Quebec				–612.28	–0.66	–737.15	–1.15
Ontario				1,120.69	1.24	1,894.04	3.02
Manitoba				–1,484.98	–1.01	–51.43	–0.05
Saskatchewan				–3,123.56	–2.14	330.21	0.31
Alberta				–1,152.74	–1.00	1,214.37	1.52
$\bar{Y}$		14,042		26,417		14,042	
Standard deviation		13,176		17,617		13,176	
Number		4,600		3,646		4,600	
$\bar{R}^2$		0.141		0.282		0.148	

Table 14

Personal income, persons born in Canada, Statistics Canada literacy survey, 1989

		1-A		1-B		2-A	
		Males		Females		Males	
	Reference group	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		–62,154.00	–24.06	–33.256.00	–17.49	–56,271.00	–21.90
Reading and numeracy score		55.05	18.44	36.30	15.85	45.89	16.02
Age		3,029.13	26.87	1,490.56	18.22	2,256.91	19.89
$(Age)^2$		–32.99	–23.96	–17.22	–17.26	–22.72	–16.28
Province of residence	British Columbia						
Newfoundland		–2,770.89	–1.59	–1,485.44	–1.20	–3,861.10	–2.34
Prince Edward Island		– –	– –	– –	– –	– –	– –
Nova Scotia		–2,430.12	–1.57	–1,293.78	–1.24	–3,090.53	–2.11
New Brunswick		–3,218.70	–1.94	91.96	0.08	–3,584.09	–2.28
Quebec		1,426.14	0.90	2,546.28	2.36	1,886.29	1.26
Ontario		1,161.15	1.28	1,981.67	3.16	933.89	1.09
Manitoba		–1,488.75	–1.01	–36.69	–0.04	–2,173.85	–1.56
Saskatchewan		–3,124.17	–2.14	327.27	0.31	–3,455.62	–2.50
Alberta		–1,153.38	–1.00	1,217.39	1.53	–1,611.67	–1.48
Language of interview	English	–2,207.44	–1.60	–3,579.10	–3.79	–2,900.93	–2.22
Employment	Not employed					14,328.00	17.02
Full-time						2,516.17	2.22
Part-time							
Full-time + weeks employed							
Part-time + weeks employed							

$\bar{Y}$	26,417	14,042	26,417	
Standard deviation	17,617	13,176	17,617	
Number	3,646	4,600	3,646	
R^2	0.283	0.150	0.358	

Table 14 (concl'd.)

	Reference group	2-B Females		3-A Males		3-B Females	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		−29,632.00	−17.30	−42,876.00	−17.19	−23,222.00	−14.22
Reading and numeracy score		24.85	11.77	42.40	14.90	21.71	10.89
Age		1,113.31	14.98	1,664.78	14.49	875.01	12.31
$(Age)^2$		−11.40	−12.47	−16.14	−11.48	−8.72	−10.00
Province of residence	British Columbia						
Newfoundland		−3,404.13	−3.06	−1,528.98	0.96	−1,506.06	−1.43
Prince Edward Island		−−	−−	−−	−−	−−	−−
Nova Scotia		−886.96	−0.95	−2,399.21	−1.70	−1,155.62	−1.30
New Brunswick		−112.61	−0.11	−2,527.09	−1.67	−121.85	−0.12
Quebec		2,862.00	2.96	1,215.08	0.88	1,755.97	1.92
Ontario		1,769.39	3.14	395.02	0.48	639.48	1.20
Manitoba		−438.23	−0.47	−2,803.82	−2.08	−1,454.17	−1.65
Saskatchewan		372.74	0.39	−2,236.96	−2.43	−492.56	−0.55
Alberta		1,191.47	1.67	−2,264.34	−2.16	440.43	0.65
Language of interview	English	−3,581.63	−4.22	−2,578.26	−2.05	−3,091.98	−3.85
Employment	Not employed						
Full-time		12,780.00	29.11				
Part-time		2,830.69	5.54				
Full-time × weeks employed				333.80	24.92	307.50	39.96
Part-time × weeks employed				49.73	2.23	87.38	8.72

$\bar{Y}$	14,042	26,417	14,042	
Standard deviation	13,176	17,617	13,176	
Number	4,600	3,646	4,600	
$\bar{R}^2$	0.316	0.402	0.389	

Table 15

Personal income, persons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Males		1-B Females		2-A Males	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		−38,061.00	−15.67	−19,776.00	−12.35	−39,912.00	−16.56
Reading and numeracy score		31.51	11.41	14.67	7.43	30.24	11.08
Age		1,645.19	14.69	816.42	11.31	1,542.81	13.84
(Age)^2		−16.90	−12.36	−8.60	−9.72	−15.51	−11.40
Province of residence	British Columbia						
Newfoundland		−795.32	−0.52	−806.92	−0.79		
Prince Edward Island		--	--	--	--		
Nova Scotia		−2,436.49	−1.79	−982.76	−1.14		
New Brunswick		−2,093.64	−1.43	−68.60	−0.07		
Quebec		233.15	0.17	1,585.53	1.79		
Ontario		−60.36	−0.08	197.79	0.38		
Manitoba		−3,281.41	−2.53	−1,813.65	−2.12		
Saskatchewan		−3,646.59	−2.84	−806.78	−0.92		
Alberta		−2,009.88	−1.99	346.41	0.52		
Language of interview	English	−1,588.94	−1.30	−2,642.95	−3.39	−663.42	−1.37
Employment	Not employed						
Full-time							
Part-time							
Full-time × weeks employed		320.44	23.10	307.03	39.55	297.06	20.03
Part-time × weeks employed		30.43	1.38	87.26	8.92	30.02	1.34

Type of income	Labour income						
Investment income		8,034.95	16.68	5,395.57	16.01	8,113.50	17.10
Government transfers		-54.67	-0.11	545.65	1.70	-579.59	-1.18
Other income		-1,666.91	-1.34	4,177.62	6.75	-1,953.93	-1.59
Industry	Not employed						
Agriculture						-1,678.28	-1.16
Other primary						9,026.38	6.18
Manufacturing, construction, and transportation						5,868.12	5.53
Trade						1,979.07	1.74
Service						4,745.36	4.44
Occupation	Not employed						
Managerial and professional							
Clerical, sales, and services							
Farm occupations							
Other primary occupations							
Industrial occupations							
$\bar{Y}$		26,417		14,042		26,417	
Standard deviation		17,617		13,176		17,617	
Number		3,646		4,600		3,646	
$\bar{R}^2$		0.0444		0.425		0.457	

Table 15 (concl'd.)

	Reference group	2-B Females		3-A Males		3-B Females	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		-20,111.00	-13.23	-36,623.00	-15.28	-16,056.00	-10.73
Reading and numeracy score		14.28	7.33	24.58	8.97	10.55	5.53
Age		793.68	11.09	1,516.66	13.81	680.92	9.76
$(Age)^2$		-8.18	-9.32	-15.33	-11.44	-6.93	-8.12
Province of residence	British Columbia						
Newfoundland							
Prince Edward Island							
Nova Scotia							
New Brunswick							
Quebec							
Ontario							
Manitoba							
Saskatchewan							
Alberta							
Language of interview	English	-1,181.95	-3.57	-738.23	-1.55	-1,023.21	-3.19
Employment	Not employed						
Full-time							
Part-time							
Full-time × weeks employed		291.52	33.13	289.35	19.71	274.23	31.92
Part-time × weeks employed		83.24	7.93	15.20	0.69	69.51	6.83
Type of income	Labour income						
Investment income		5,335.58	16.03	7,241.58	15.24	4,826.05	14.90
Government transfers		426.57	1.34	-135.46	-0.28	491.71	1.60
Other income		4,126.22	6.74	-2,398.91	-1.98	3,858.63	6.50

Industry	Not employed						
Agriculture		−4,896.52	−4.28				
Other primary		14,335.85	2.44				
Manufacturing, construction, and transportation		2,809.45	4.49				
Trade		−956.15	1.61				
Service		1,981.17	3.96				
Occupation	Not employed						
Managerial and professional				10,332.00	9.25	7,081.32	12.71
Clerical, sales, and services				3,884.24	3.63	232.28	0.48
Farm occupations				858.42	−0.62	−4,747.00	−3.98
Other primary occupations				10,121.00	6.19	3,079.54	1.02
Industrial occupations				3,965.96	3.78	1,484.18	2.01
$\bar{Y}$		14,042		26,417		14,042	
Standard deviation		13,176		17,617		13,176	
Number		4,600		3,646		4,600	
$\bar{R}^2$		0.436		0.472		0.469	

Table 16

Personal income, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Males		1-B Females		2-A Males	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Constant		13,310.00	4.54	-224.01	-0.12	-54,758.00	-7.53
Reading and numeracy score		31.14	5.24	32.64	8.26	35.98	6.50
Age						3,026.11	8.79
$(Age)^2$						-31.29	-7.78
Province of residence	British Columbia						
Newfoundland							
Prince Edward Island							
Nova Scotia							
New Brunswick							
Quebec							
Ontario							
Manitoba							
Saskatchewan							
Alberta							
$\bar{Y}$		28,069		14,564		28,069	
Standard deviation		18,887		13,666		18,887	
Number		502		600		502	
$\bar{R}^2$		0.050		0.101		0.220	

	Reference group	2-B Females		3-A Males		3-B Females	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		–35,909.00	–6.48	–60,976.00	–8.07	–38,161.00	–6.85
Reading and numeracy score		32.05	7.97	38.31	6.92	32.48	8.18
Age		1,786.39	7.00	3,091.15	9.00	1,833.42	7.35
$(Age)^2$		–20.14	–6.85	–32.03	–7.99	–20.39	–7.10
Province of residence	British Columbia						
Newfoundland				12,604.00	0.74	–3,012.60	–0.13
Prince Edward Island				..	..	..	..
Nova Scotia				2,632.53	0.49	–11,116.00	–1.81
New Brunswick				–3,293.09	–0.35	–6,701.25	–1.31
Quebec				7,571.55	2.90	–4,226.55	–2.26
Ontario				5,562.72	2.84	1,976.54	–2.02
Manitoba				5,691.42	1.36	–6,140.45	–2.08
Saskatchewan				–7,301.14	–1.01	–2,968.42	–0.81
Alberta				–227.63	–0.08	–15.20	–0.01
$\bar{Y}$		14,564		28,069		14,564	
Standard deviation		13,666		18,887		13,666	
Number		600		502		600	
$\bar{R}^2$		0.167		0.236		0.210	

Table 17

Personal income, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Males		1-B Females		2-A Males	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		–61,669.00	–8.21	–38,147.00	–6.84	–58,114.00	–7.71
Reading and numeracy score		38.89	7.07	32.48	8.17	35.27	6.67
Age		3,115.70	9.14	1,832.30	7.34	2,268.00	6.42
$(Age)^2$		–32.35	–8.12	–20.38	–7.09	–21.65	–5.22
Province of residence	British Columbia						
Newfoundland		12,626.00	0.75	–3,016.42	–0.14	9,879.19	0.61
Prince Edward Island		– –	– –	– –	– –	– –	– –
Nova Scotia		2,633.81	0.50	–11,117.00	–1.81	1,149.57	0.23
New Brunswick		–2,464.03	–0.27	–6,678.65	–1.30	–2,401.99	–0.27
Quebec		14,593.00	4.04	–4,029.26	–1.86	12,449.00	3.59
Ontario		5,793.44	2.98	2,979.49	2.02	5,397.52	2.90
Manitoba		5,743.86	1.38	–6,138.94	–2.08	4,944.03	1.24
Saskatchewan		–7,229.51	–1.01	–2,968.61	–0.81	–2,939.06	0.43
Alberta		–226.21	–0.08	–14.36	–0.01	1,065.54	0.40
Language of interview	English	–10,487.00	–2.79	–457.52	–0.18	–8,306.72	–2.29
Employment	Not employed						
Full-time						15,257.00	6.38
Part-time						4,727.61	1.21
Full-time + weeks employed							
Part-time + weeks employed							

$\bar{Y}$	28,069	14,564	28,069
Standard deviation	18,887	13,666	18,887
Number	502	600	502
$\bar{R}^2$	0.246	0.209	0.309

Table 17 (concl'd.)

	Reference group	2-B Females		3-A Males		3-B Females	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		–31,759.00	–6.61	–41,507.00	–5.72	–29,078.00	–6.18
Reading and numeracy score		26.97	7.82	32.98	6.54	25.18	7.48
Age		1,028.39	4.61	1,416.68	3.99	1,017.39	4.68
$(Age)^2$		–9.50	–3.64	–12.14	–2.92	–9.68	–3.82
Province of residence	British Columbia						
Newfoundland		38.71	0.00	12,278.00	0.80	–189.69	–0.01
Prince Edward Island		--	--	--	--	--	--
Nova Scotia		–5,752.07	–1.09	815.84	0.17	–5,358.86	–1.04
New Brunswick		–4,405.71	–1.00	–2,443.04	–0.29	–4,136.74	–0.96
Quebec		–1,793.23	–0.96	9,528.69	2.86	–3,188.68	–1.76
Ontario		3,002.74	2.37	3,471.53	1.94	2,424.97	1.96
Manitoba		–5,408.84	–2.13	3,705.99	0.97	–3,502.46	–1.41
Saskatchewan		–2,236.11	–0.71	–2,648.29	–0.40	–3,310.34	–1.08
Alberta		217.62	0.12	2,332.44	0.91	–994.33	–0.54
Language of interview	English	–2,290.92	–1.05	6,720.14	–1.94	–1,313.47	–0.62
Employment	Not employed						
Full-time		14,604.00	13.22				
Part-time		2,588.35	1.79				
Full-time + weeks employed				394.96	9.89	309.81	14.82
Part-time + weeks employed				116.07	1.40	48.61	1.66

$\bar{Y}$	14,564	28,069	14,564	
Standard deviation	13,666	18,887	13,666	
Number	600	502	600	
R^2	0.417	0.374	0.446	

Table 18

Personal income, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Males		1-B Females		2-A Males	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Constant		–35,889.00	–5.06	–26,239.00	–5.60	–33,081.00	–4.25
Reading and numeracy score		27.24	5.48	20.08	5.82	25.34	4.90
Age		1,158.83	3.26	1,001.00	4.46	1,184.47	3.30
$(Age)^2$		–10.32	–2.50	–10.20	–3.88	–10.92	–2.60
Province of residence	British Columbia						
Newfoundland		11,767.00	0.79	–2,345.30	–0.13	12,068.00	0.81
Prince Edward Island		– –	– –	– –	– –	– –	– –
Nova Scotia		743.75	0.16	–5,771.17	–1.14	75.44	0.02
New Brunswick		–3,392.25	–0.42	–4,277.41	–1.02	–3,150.28	–0.38
Quebec		10,127.00	3.14	–2,574.31	–1.44	10,129.00	3.11
Ontario		3,662.19	2.12	2,460.38	2.03	3,684.63	2.13
Manitoba		4,656.54	1.27	–3,653.85	–1.50	5,059.27	1.37
Saskatchewan		–2,630.15	–0.42	–4,618.84	–1.52	–2,949.62	–0.46
Alberta		3,413.07	1.37	–1,251.46	–0.70	3,311.29	1.32
Language of interview	English	–5,809.10	–1.74	–1,166.72	–0.56	–5,620.53	–1.65
Employment	Not employed						
Full-time							
Part-time							
Full-time × weeks employed		409.11	9.70	300.60	13.87	402.81	9.33
Part-time × weeks employed		142.14	1.71	56.96	1.94	148.94	1.78

Type of income	Labour income						
Investment income		8,874.18	6.18	5,236.93	5.11	5,660.85	5.96
Government transfers		336.59	0.21	−227.18	−0.25	210.26	0.13
Other income		−5,180.27	−1.26	2,281.34	1.07	−5,231.21	−1.26
Date of immigration	Before 1950						−01.7
Canadian citizen						−1,272.87	
1950-59						−1,583.86	−0.58
1960-69						−320.31	−0.11
1970-79						−897.10	−0.30
1980-89						−3,708.54	−1.16
Not stated						334.36	0.33
First language not English nor French	English or French						
Age starting English or French	0-4						
5-10							
11-15							
16-20							
21 and over							
Never							
Not stated							
$\bar{Y}$		28,069		14,564		28,069	
Standard deviation		18,887		13,666		18,887	
Number		502		600		502	
$\bar{R}^2$		0.418		0.467		0.414	

Table 18 (concl'd.)

	Reference group	2-B Females		3-A Males		3-B Females	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Constant		–22,737.00	–4.51	–38,287.00	–4.73	–19,908.00	–3.84
Reading and numeracy score		17.00	4.79	27.60	4.39	12.29	2.90
Age		905.93	4.03	1,334.88	3.65	914.99	4.10
$(Age)^2$		–9.67	–3.65	–12.19	–2.87	–9.84	–3.28
Province of residence	British Columbia						
Newfoundland		–459.82	–0.02	11,151.00	0.75	–898.36	–0.05
Prince Edward Island		– –	– –	– –	– –	– –	– –
Nova Scotia		–5,311.19	1.06	67.70	0.01	–5,916.87	1.19
New Brunswick		–3,616.19	–0.86	–3,664.09	–0.45	–4,491.47	–1.08
Quebec		–2,510.22	–1.42	10,819.00	3.24	–2,512.16	–1.42
Ontario		2,433.73	2.00	4,127.96	2.37	2,394.12	1.97
Manitoba		–3,100.96	–1.28	4,456.81	1.20	–2,931.73	–1.19
Saskatchewan		–4,336.81	–1.45	–1,923.12	–0.30	–5,053.78	–1.70
Alberta		–919.94	–0.52	3,140.00	1.25	–1,213.09	–0.68
Language of interview	English	53.56	0.03	–5,334.26	–1.52	–137.75	–0.07
Employment	Not employed						
Full-time							
Part-time							
Full-time × weeks employed		309.82	14.23	387.78	8.74	318.04	14.61
Part-time × weeks employed		60.01	2.06	148.18	1.75	73.60	2.52
Type of income	Labour income						
Investment income		5,186.06	5.10	8,745.24	5.93	5,306.87	5.24
Government transfers		–34.20	–0.00	16.50	0.01	–155.86	–0.17
Other income		2,303.42	1.09	–5,248.26	–1.26	2,810.89	1.33

Date of immigration	Before 1950						
Canadian citizen		−4,081.90	−0.94	54.63	0.01	−4,795.10	−1.11
1950-59		3,108.49	1.74	−1,164.87	−0.41	4,072.80	2.24
1960-69		1,768.33	0.95	689.05	0.23	2,004.26	1.07
1970-79		125.76	0.06	−82.59	−0.03	702.38	0.36
1980-89		−2,601.36	1.33	−2,344.43	−0.70	−1,570.56	−0.80
Not stated		1,689.31	0.26	1,207.35	0.12	1,719.28	0.27
First language not English nor French	English or French			5,379.47	1.96	1,694.20	0.94
Age starting English or French	0-4						
5-10				−4,250.82	−1.46	−5,942.12	−3.13
11-15				−8,629.26	−2.68	−1,590.29	−0.71
16-20				−6,767.52	−1.68	−4,999.97	−2.04
21 and over				−6,015.73	−1.70	−3,879.86	−1.77
Never				2,238.33	0.31	−6,593.55	−1.58
Not stated				−4,709.38	−0.43	364.61	0.10
$\bar{Y}$		14,564		28,069		14,564	
Standard deviation		13,666		18,887		13,666	
Number		600		502		600	
$\bar{R}^2$		0.481		0.417		0.493	

Table 19

Personal income, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1-A Males		1-B Females	
		Coefficient	*t*-value	Coefficient	*t*-value
Constant		−29,232.00	−3.75	−18,345.00	−3.60
Reading and numeracy score		28.02	4.40	11.86	2.85
Age		1,213.50	3.38	792.99	3.52
$(Age)^2$		−11.12	−2.66	−8.32	−3.11
Province of residence	British Columbia				
Newfoundland					
Prince Edward Island					
Nova Scotia					
New Brunswick					
Quebec					
Ontario					
Manitoba					
Saskatchewan					
Alberta					
Language of interview	English	984.92	0.43	−2,780.26	−1.66
Employment	Not employed				
Full-time					
Part-time					
Full-time × weeks employed		433.26	8.97	283.44	11.52
Part-time × weeks employed		191.17	2.23	24.07	0.77
Type of income	Labour income				
Investment income		8,297.86	5.64	4,905.01	4.84
Government transfers		−71.17	−0.04	0.73	0.00

Other income		−5,326.53	−1.29	1,564.05	0.73
Date of immigration	Before 1950				
Canadian citizen		−1,493.63	−0.20	−6,219.84	−1.44
1950-59		−2,008.60	−0.71	3,103.63	1.72
1960-69		−951.45	−0.32	1,550.52	0.83
1970-79		−1,081.84	−0.36	−529.60	−0.28
1980-89		−3,324.97	−1.00	−2,915.79	−1.50
Not stated		2,558.38	0.25	2,826.35	0.44
First language not English nor French	English or French	3,648.77	1.36	1,431.32	0.80
Age starting English or French	0-4				
5-10		−1,899.43	−0.67	−5,548.40	−2.93
11-15		−6,094.92	−1.93	−2,517.89	−1.13
16-20		−3,581.80	−0.91	−3,559.27	−1.47
21 and over		−3,400.45	−0.98	−2,916.96	−1.34
Never		6,296.92	0.88	−4,805.24	−1.16
Not stated		−874.80	−0.08	733.67	0.12
Industry	Not employed				
Agriculture		−17,000.00	−3.24	−5,719.32	−1.67
Other primary		2,354.43	0.45	16,179.00	1.15
Manufacturing, construction, and transportation		−2,643.74	−0.81	2,490.12	1.58
Trade		−7,299.60	−2.10	3,558.87	2.16
Services		−4,943.02	−1.49	5,572.92	3.91
Occupation	Not employed				
Management and professional					
Clerical, sales, and services					
Farm occupations					
Other primary occupations					
Industrial occupations					
$\bar{Y}$		28,069		14,564	
Standard deviation		18,887		13,666	
Number		502		600	
R^2		0.427		0.496	

Table 19 (concl'd.)

	Reference group	2-A Males		2-B Females	
		Coefficient	t-value	Coefficient	t-value
Constant		-24,713.00	-3.15	-17,058.00	-3.44
Reading and numeracy score		21.17	3.19	8.27	2.01
Age		1,112.30	3.11	791.70	3.64
$(Age)^2$		-9.85	-2.37	-8.34	-3.24
Province of residence	British Columbia				
Newfoundland					
Prince Edward Island					
Nova Scotia					
New Brunswick					
Quebec					
Ontario					
Manitoba					
Saskatchewan					
Alberta					
Language of interview	English	2,362.93	1.04	-2,834.77	-1.74
Employment	Not employed				
Full-time					
Part-time					
Full-time × weeks employed		410.14	8.62	272.22	11.31
Part-time × weeks employed		150.37	1.77	30.66	1.01
Type of income	Labour income				
Investment income		8,665.41	5.96	4,617.66	4.69
Government transfers		-695.43	-0.44	-67.82	-0.08
Other income		-5,985.71	-1.46	2,323.05	1.12
Date of immigration	Before 1950				
Canadian citizen		56.22	0.01	-4,377.34	-1.04
1950-59		-2,110.33	-0.76	2,831.75	1.61

1960-69		−827.40	−0.28	1,072.56	0.59
1970-79		−520.50	−0.17	−567.17	−0.30
1980-89		−3,341.44	−1.01	−3,364.33	−1.77
Not stated		3,473.56	0.35	2,023.58	0.32
First language not English nor French	English or French	3,912.47	1.47	1,179.56	0.68
Age starting English or French	0-4				
5-10		−1,777.18	−0.64	−4,664.62	−2.50
11-15		−6,600.36	−2.12	−820.47	−0.38
16-20		−4,790.52	−1.23	−2,414.15	−1.02
21 and over		−4,126.90	−1.20	−1,468.16	−0.69
Never		6,918.69	0.97	−3,783.11	−0.93
Not stated		−3,806.61	−0.35	538.46	0.09
Industry	Not employed				
Agriculture					
Other primary					
Manufacturing, construction, and transportation					
Trade					
Services					
Occupation	Not employed				
Management and professional		−166.06	−0.05	9,146.51	5.96
Clerical, sales, and services		−7,156.95	−2.20	3,563.26	2.61
Farm occupations		−19,143.00	−3.32	−5,617.79	−1.55
Other primary occupations		1,235.33	0.15	empty cell	empty cell
Industrial occupations		−2,498.75	−0.78	1,511.62	0.96
$\bar{Y}$		28,069		14,564	
Standard deviation		18,807		13,666	
Number		502		600	
$\bar{R}^2$		0.436		0.520	

A The Writing Score

As mentioned at the beginning of this paper, Statistics Canada did not develop a writing ability score. The reason for this is as follows.

The Survey of Literacy Skills Used in Daily Activities of 1989 contained only two writing problems. Question 17 of the test was:

> You have to do some errands this afternoon. You leave a note asking a member of your household to turn on the oven at 5:30 to pre-heat it to 230° C (450° F). Write the note in the space below.

Question 25 was:

> The switch on the hand mixer you bought at Cray's Hardware Store last month is broken and the appliance will not turn on. It is still under warranty. In the list of procedures for returning the appliance for repair you find this instruction:
>
> > Enclose a letter explaining the nature of your problem, the service or repair desired, the date and place of purchase, and your name and address.
>
> Use the space on the next page to write the letter you will include when you send the mixer to the service centre you chose from the list below.

For each of the questions Statistics Canada reported how many surveyed persons gave a completely correct answer, a partially correct answer that contained at least the essential elements, and all other answers. Grammar and spelling mistakes were ignored.

In the case of question 17, a completely correct answer had to contain the instruction to turn on the oven, the time, and the temperature. The partially correct answer had to contain the instruction to turn on the oven, but could omit time and/or temperature. We treated all other responses as incorrect.

In the case of question 25, a completely correct answer had to mention the broken switch, the place and date of purchase, and the sender's address. A partially correct answer had to mention the essential elements (namely, that the switch was broken and the sender's address) but could omit place and/or date of purchase. We treated all other answers as incorrect.

Statistics Canada judged that the collected information on writing was not sufficient to create a scoring system comparable to those for reading and numeracy.

We wished to perform quantitative analysis on the results of the writing test. For this purpose we decided to create a scoring system, however primitive

and questionable it may prove to be. It turned out that the results of our scoring system essentially confirmed the findings of the reading and numeracy tests.

We proceeded as follows. First, we decided that completely correct answers should count for twice as much as partially correct answers.

Second, inspection of the Statistics Canada results showed that about twice as many surveyed persons gave a completely correct answer to the oven question than to the broken mixer question. We decided that the broken mixer question should count for twice as much as the oven question.

This yielded the following scoring table.

	Scores	
	Oven	Broken mixer
Completely correct	2	4
Partially correct	1	2
All other	0	0

The total writing score of each surveyed person consisted of his/her sum of scores for the two questions. Thus the possible score for each surveyed person ranged from zero to six.

This scoring system permitted the analysis of writing scores, but did not permit the inclusion of the writing score in the analysis of personal income.

Table A-1

Writing test scores, persons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1		2		3	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		4.29	48.31	4.51	49.72	4.46	49.03
Province of birth	British Columbia						
Newfoundland	and Yukon	–1.05	–7.01	–1.06	–7.09	–1.10	–7.37
Prince Edward Island		..	..	..	..	..	..
Nova Scotia		–0.80	–5.68	–0.81	–5.73	–0.85	–6.01
New Brunswick		–0.84	–5.68	–0.81	–5.50	–0.86	–5.84
Quebec		–0.66	–6.76	–0.65	–6.69	–0.63	–6.54
Ontario		–0.18	–1.86	–0.15	–1.58	–0.14	–1.44
Manitoba		–0.28	–2.11	–0.27	–2.01	–0.32	–2.44
Saskatchewan		–0.38	–3.02	–0.38	–3.03	–0.49	–3.85
Alberta and NorthwestTerritories		–0.23	–1.87	–0.22	–1.78	–0.24	–1.98
Gender	Female			–0.47	–10.46	–0.47	–10.40
Mover	Stayer					0.30	4.75
$\bar{Y}$		3.86		3.86		3.86	
Standard deviation		2,07		2.07		2.07	
Number		8,206		8,206		8,206	
$\bar{R}^2$		0.017		0.030		0.033	

Table A-2

Writing test scores, persons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1		2		3	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		4.52	51.18	4.57	47.66	4.56	47.50
Province of birth	British Columbia and Yukon						
Newfoundland		–0.77	–5.75	–0.80	–5.96	–0.79	–5.87
Prince Edward Island		..	..	..	..	..	..
Nova Scotia		–0.50	–3.92	–0.48	–3.81	–0.47	–3.75
New Brunswick		–0.53	–4.03	–0.51	–3.88	–0.51	–3.86
Quebec		–0.33	–3.79	–0.32	–3.68	–0.31	–3.60
Ontario		–0.02	–0.19	–0.00	–0.02	–0.00	–0.04
Manitoba		–0.10	–0.83	–0.06	–0.53	–0.07	–0.60
Saskatchewan		–0.19	–1.68	–0.13	–1.15	–0.14	–1.22
Alberta and NorthwestTerritories		–0.12	–1.12	–0.10	–0.97	–0.11	–1.00
Gender	Female	–0.46	–11.13	–0.47	–11.52	–0.47	–11.58
Mover	Stayer	0.15	2.55	0.19	3.25	0.18	3.21
Schooling	High-school diploma						
None		–3.38	–6.40	–3.13	–5.95	–3.15	–5.99
Primary only		–2.27	–29.05	–1.98	–23.64	–1.97	–23.62
Some secondary		–0.86	–15.35	–0.80	–14.13	–0.80	–14.14
Some trade/vocational		–0.01	–0.03	–0.01	–0.05	–0.01	–0.06
Trade/vocational diploma		0.01	0.06	0.03	0.30	0.03	0.29
Some community college		0.43	4.00	0.36	3.33	0.35	3.25
Community college diploma		0.47	6.02	0.45	5.79	0.46	5.82
Some university		0.61	6.60	0.58	6.23	0.58	6.25

University diploma below bachelor's degree		0.60	4.15	0.61	4.25	0.61	4.26
Bachelor's degree or above		1.02	13.24	1.03	13.42	1.03	13.45
Age	35-44						
16-24				0.07	1.02	0.07	1.08
25-34				−0.01	−0.11	−0.00	−0.02
45-54				−0.12	−1.69	−0.13	−1.81
55-59				−0.59	−8.44	−0.60	−8.55
Mother immigrated before age 16	All others					0.17	1.98
$\bar{Y}$		3.86		3.86		3.86	
Standard deviation		2.07		2.07		2.07	
Number		8,206		8,206		8,206	
$\bar{R}^2$		0.217		0.226		0.226	

Table A-3

Writing test scores, persons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1		2		3	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		4.70	45.12	4.62	43.55	4.48	40.63
Province of birth	British Columbia and Yukon						
Newfoundland		-0.76	-5.65	-0.80	-5.92	-0.81	-5.98
Prince Edward Island		--	--	--	--	--	--
Nova Scotia		-0.47	-3.69	-0.56	-3.35	-0.57	-4.43
New Brunswick		-0.47	-3.57	-0.56	-4.19	-0.56	-4.20
Quebec		-0.30	-3.36	-0.31	-3.46	-0.31	-3.45
Ontario		-0.00	-0.01	-0.05	-0.51	-0.05	-0.53
Manitoba		-0.05	-0.38	-0.04	-0.34	-0.03	-0.28
Saskatchewan		-0.12	-1.01	-0.19	-1.68	-0.20	-1.74
Alberta and NorthwestTerritories		-0.10	-0.90	-0.10	-0.96	-0.10	-0.91
Gender	Female	-0.47	-11.58	-0.47	-11.63	-0.47	-11.63
Mover	Stayer	0.17	2.95	0.19	3.32	0.19	3.31
Schooling	High-school diploma						
None		-3.16	-6.02	-3.16	-6.39	-3.02	-5.77
Primary only		-1.92	-22.59	-1.92	-22.60	-1.80	-20.26
Some secondary		-0.77	-13.58	-0.78	-13.60	-0.66	-10.74
Some trade/vocational		-0.02	-0.12	-0.04	-0.19	0.01	0.06
Trade/vocational diploma		0.01	0.06	0.01	0.10	0.05	0.52
Some community college		0.33	3.07	0.33	3.05	0.31	2.86
Community college diploma		0.39	4.92	0.39	4.97	0.36	4.58
Some university		0.49	5.14	0.50	5.28	0.43	4.51
University diploma below bachelor's degree		0.51	3.54	0.51	3.58	0.43	3.01

Bachelor's degree or above		0.92	11.46	0.93	11.65	0.83	10.11
Age	35-44						
16-24		-0.01	-0.18	-0.01	-0.18	-0.06	-0.84
25-34		-0.04	-0.71	-0.05	-0.80	-0.05	-0.81
45-54		-0.12	-1.66	-0.13	-1.84	-0.13	-1.88
55-59		-0.58	-8.22	-0.58	-8.26	-0.58	-8.26
Mother immigrated before age 16	All others	0.19	2.17	0.19	2.25	0.19	2.17
Highest parental education	High-school diploma						
None		-0.52	-1.64	-0.53	-1.66	-0.51	-1.61
Don't know		-0.32	-3.72	-0.33	-3.80	-0.31	-3.53
Primary only		-0.20	-3.12	-0.20	-3.26	-0.18	-2.89
Some secondary		-0.23	-3.45	-0.24	-3.50	-0.22	-3.22
Some trade/vocational		-0.57	-3.02	-0.56	-2.96	-0.56	-2.96
Trade/vocational diploma		0.27	2.70	0.27	2.68	0.26	2.61
Some community college		-0.16	-0.90	-0.14	-0.79	-0.16	-0.87
Community college diploma		0.21	2.13	0.21	2.08	0.20	2.04
Some university		-0.31	-2.11	-0.28	-1.90	-0.29	-1.96
University diploma below bachelor's degree		0.28	1.57	0.27	1.52	0.24	1.34
Bachelor's degree or above		0.11	1.18	0.13	1.41	0.11	1.18
Area population	Urban, 500,000 and over						
Urban, 100,000-500,000				0.27	3.97	0.27	3.99
Urban, 30,000-100,000				0.22	3.12	0.23	3.28
Urban, less than 30,000				0.12	1.87	0.12	1.96
Rural and Prince Edward Island				0.17	2.91	0.18	3.02
Academic school program	Not academic					0.26	4.73
$\bar{Y}$		3.86		3.86		3.86	
Standard deviation		2.07		2.07		2.07	
Number		8,206		8,206		8,206	
$\bar{R}^2$		0.232		0.234		0.236	

Table A-4

Writing test scores, persons born in Canada, Statistics Canada literacy survey, 1989

	Reference group	1		2	
		Coefficient	t-value	Coefficient	t-value
Constant		4.50	40.90	3.20	20.82
Province of birth	British Columbia and Yukon				
Newfoundland		-0.87	-6.42		
Prince Edward Island		--	--		
Nova Scotia		-0.61	-4.77		
New Brunswick		-0.57	-4.32		
Quebec		-0.31	-3.55		
Ontario		-0.07	-0.76		
Manitoba		-0.06	-0.50		
Saskatchewan		-0.20	-1.76		
Alberta and NorthwestTerritories		-0.12	-1.08		
Gender	Female	-0.48	-11.78	-0.48	-11.79
Mover	Stayer	0.19	3.36	0.23	4.14
Schooling	High-school diploma				
None		-2.59	-4.92	-2.64	-5.02
Primary only		-1.72	-19.28	-1.74	-19.50
Some secondary		-0.64	-10.41	-0.65	-10.59
Some trade/vocational		0.10	0.55	0.10	0.52
Trade/vocational diploma		0.04	0.42	0.02	0.22
Some community college		0.30	2.78	0.29	2.73
Community college diploma		0.35	4.50	0.34	4.38
Some university		0.43	4.50	0.42	4.43

University diploma below bachelor's degree		0.42	2.95	0.42	2.93
Bachelor's degree or above		0.83	10.04	0.82	10.00
Age	35-44				
16-24		-0.04	-0.67	-0.04	-0.67
25-34		-0.04	-0.71	-0.04	-0.68
45-54		-0.15	-2.17	-0.15	-2.14
55-59		-0.63	-8.97	-0.62	-8.78
Mother immigrated before age 16	All others	0.16	1.93	0.20	2.32
Highest parental education	High-school diploma				
None		-0.54	-1.70	-0.50	-1.57
Don't know		-0.32	-3.71	-0.32	-3.73
Primary only		-0.19	-3.05	-0.19	-3.00
Some secondary		-0.21	-3.18	-0.21	-3.11
Some trade/vocational		-0.57	-3.02	-0.54	-2.88
Trade/vocational diploma		0.26	2.56	0.26	2.62
Some community college		-0.17	-0.93	-0.16	-0.89
Community college diploma		0.17	1.68	0.17	1.67
Some university		-0.27	-1.83	-0.29	-1.99
University diploma below bachelor's degree		0.20	1.16	0.22	1.22
Bachelor's degree or above		0.08	0.91	0.08	0.88
Area population	Urban, 500,000 and over				
Urban, 100,000-500,000		0.26	3.91	0.24	3.62
Urban, 30,000-100,000		0.24	3.48	0.21	3.15
Urban, less than 30,000		0.14	2.18	0.11	1.75
Rural and Prince Edward Island		0.18	3.16	0.17	2.93
Academic school program	Not academic	0.25	4.65	0.25	4.56
Infirmities	None				
Visual problems before age 16		-0.02	-0.10	0.00	0.00
Visual problems now		0.16	1.01	0.16	0.97
Hearing problems before age 16		-0.11	-0.77	-0.12	-0.84

Table A-4 (cont'd.)

	Reference group	1		2	
		Coefficient	*t*-value	Coefficient	*t*-value
Hearing problems now		0.34	2.79	0.35	2.87
Speech disability before age 16		0.68	3.99	0.67	3.89
Speech disability now		−1.24	−4.30	−1.24	−4.28
Learning disability before age 16		−0.55	−3.02	−0.53	−2.90
Learning disability now		−0.48	−2.10	−0.47	−2.08
Six-month illness before age 16		0.09	0.47	0.08	0.41
Six-month illness now		−0.48	−2.00	−0.46	−1.94
Average personal income				0.01	8.84
Average spending per student					
$\bar{Y}$		3.86		3.86	
Standard deviation		2.07		2.07	
Number		8,206		8,206	
$\bar{R}^2$		0.243		0.242	

	Reference group	3°		4°		5°	
		Age 16-34		Age 16-34		Age 16-34	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Constant		4.49	32.87	3.49	14.24	3.17	11.26
Province of birth	British Columbia						
Newfoundland	and Yukon	−0.81	−4.37				
Prince Edward Island		..	..				
Nova Scotia		−0.55	−3.09				
New Brunswick		−0.44	−2.33				
Quebec		−0.14	−1.16				
Ontario		−0.11	−0.97				
Manitoba		−0.10	−0.62				
Saskatchewan		−0.11	−0.68				
Alberta and Northwest Territories		−0.15	−1.04				
Gender	Female	−0.56	−9.87	−0.56	−9.96	−0.56	−9.88
Mover	Stayer	0.24	2.88	0.23	2.80	0.24	2.88
Schooling	High-school						
None	diploma	−1.77	−1.94	−1.85	−2.03	−1.77	−1.95
Primary only		−1.34	−5.71	−1.38	−5.86	−1.35	−5.74
Some secondary		−0.54	−6.63	−0.57	−6.96	−0.55	−6.69
Some trade/vocational		0.21	0.89	0.18	0.77	0.20	0.84
Trade/vocational diploma		0.20	1.38	0.15	1.09	0.20	1.39
Some community college		0.34	2.86	0.34	2.90	0.32	2.74
Community college diploma		0.35	3.48	0.34	3.38	0.34	3.32
Some university		0.42	3.54	0.40	3.44	0.42	3.59
University diploma below bachelor's degree		0.26	1.14	0.30	1.33	0.22	0.99
Bachelor's degree or above		0.76	6.64	0.75	6.61	0.73	6.46

Table A-4 (concl'd.)

	Reference group	3°		4°		5°	
		Age 16-34		Age 16-34		Age 16-34	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Age	35-44						
16-24		−0.03	−0.47	−0.03	−0.49	−0.03	−0.56
25-34							
45-54							
55-69							
Mother immigrated before age 16	All others	−0.17	−1.11	−0.19	−1.19	−0.14	−0.89
Highest parental education	High-school diploma						
None		−0.82	−0.66	−0.70	−0.56	−0.76	−0.61
Don't know		−0.48	−3.18	−0.47	−3.16	−0.51	−3.37
Primary only		−0.38	−4.19	−0.35	−3.99	−0.42	−4.83
Some secondary		−0.30	−3.43	−0.30	−3.43	−0.31	−3.61
Some trade/vocational		0.02	0.07	0.05	0.19	0.04	0.17
Trade/vocational diploma		0.24	1.94	0.25	2.09	0.23	1.91
Some community college		−0.24	−1.17	−0.23	−1.11	−0.22	−1.07
Community college diploma		0.25	2.02	0.26	2.09	0.24	1.94
Some university		0.13	0.69	0.12	0.65	0.11	0.60
University diploma below bachelor's degree		0.15	0.73	0.15	0.71	0.15	0.73
Bachelor's degree or above		0.14	1.28	0.13	1.22	0.14	1.34
Area population	Urban, 500,000 and over						
Urban, 100,000-500,000		0.20	2.17	0.18	2.02	0.22	2.43
Urban, 30,000-100,000		0.19	2.01	0.16	1.68	0.19	2.00
Urban, less than 30,000		0.19	2.14	0.14	1.60	0.18	2.06
Rural and Prince Edward Island		0.28	3.31	0.26	3.05	0.28	3.27

Academic school program	Not academic	0.25	3.59	0.24	3.52	0.25	3.60
Infirmities	None						
Visual problems before age 16		0.08	0.30	0.07	0.27	0.09	0.35
Visual problems now		−0.11	−0.36	−0.10	−0.35	−0.12	−0.40
Hearing problems before age 16		−0.14	−0.74	−0.15	−0.76	−0.13	−0.68
Hearing problems now		−0.10	−0.42	−0.09	−0.40	−0.10	−0.41
Speech disability before age 16		0.71	3.63	0.68	3.47	0.73	3.72
Speech disability now		−1.07	−2.98	−1.05	−2.90	−1.06	−2.95
Learning disability before age 16		−0.48	−2.03	−0.45	−1.91	−0.48	−2.05
Learning disability now		−0.86	−2.86	−0.86	−2.85	−0.87	−2.88
Six-month illness before age 16		−0.02	−0.08	−0.01	−0.02	−0.03	−0.11
Six-month illness now		−0.64	−1.71	−0.62	−1.66	−0.61	−1.63
Average personal income				0.01	4.03		
Average spending per student						1.17	4.64
$\overline{Y}$		4.20		4.20		4.20	
Standard deviation		1.97		1.97		1.97	
Number		4,208		4,208		4,208	
$\overline{R}^2$		0.154		0.153		0.154	

*For these equations the age reference group is 25-34.

Table A-5

Writing test scores, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1		2		3	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Constant		4.41	19.23	4.23	17.75	3.81	12.25
Place of birth	United States						
South America		−1.55	−5.20	−1.50	−5.00	−1.38	−4.49
Western Europe		−0.79	−2.69	−0.80	−2.72	−0.88	−2.90
Eastern Europe		−1.71	−5.03	−1.70	−5.01	−1.69	−4.87
Northern Europe		−0.07	−0.25	−0.06	−0.23	−0.04	−0.14
Southern Europe		−2.65	−9.58	−2.65	−9.60	−2.81	−9.97
Africa		−0.91	−2.50	−0.94	−2.59	−0.82	−2.21
Asia and Oceania		−1.65	−6.20	−1.62	−6.12	−1.43	−5.14
Gender	Female			0.35	2.73	0.35	2.77
Year of immigration	Before 1950						
Canadian citizen						1.16	1.72
1950-59						0.52	1.96
1960-69						0.79	2.96
1970-79						0.29	1.06
1980-89						0.06	0.22
Not stated						−0.13	−0.13
$\bar{Y}$		3.19		3.19		3.19	
Standard deviation		2.26		2.26		2.26	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.152		0.158		0.166	

Table A-6

Writing test scores, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1		2		3	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		3.19	8.96	2.51	7.32	2.75	8.12
Place of birth	United States						
South America		−0.92	−2.97	−0.96	−3.28	−1.05	−3.62
Western Europe		−0.56	−1.86	−0.52	−1.81	−0.69	−3.42
Eastern Europe		−1.35	−3.90	−1.04	−3.15	−1.09	−3.36
Northern Europe		0.24	0.89	0.34	1.34	0.27	1.05
Southern Europe		−2.36	−8.28	−1.99	−7.31	−1.96	−7.31
Africa		−0.52	−1.43	−0.36	−1.04	−0.49	−1.43
Asia and Oceania		−1.23	−4.44	−1.10	−4.22	−1.19	−4.56
Gender	Female	0.33	2.66	0.22	1.84	0.18	1.51
Year of immigration	Before 1950						
Canadian citizen		1.54	2.27	2.23	3.46	2.13	3.37
1950-59		0.64	2.39	0.67	2.65	0.51	2.04
1960-69		0.79	2.94	0.72	2.85	0.52	2.04
1970-79		0.29	1.06	0.32	1.22	0.20	0.77
1980-89		0.34	1.11	0.60	2.10	0.45	1.60
Not stated		−0.14	−0.14	0.24	0.25	0.07	0.08
Schooling before immigration	High-school diploma						
None		0.87	3.93	0.16	0.72	0.02	0.08
Primary only		−0.02	−0.12	−0.30	−1.57	−0.31	−1.60
Some secondary		−0.24	−1.00	−0.26	−1.15	−0.34	−1.50
Some trade/vocational		−0.78	−1.68	−0.85	−1.93	−0.44	−0.99
Trade/vocational diploma		−0.19	−0.57	−0.32	−1.02	−0.15	−0.49

Table A-6 (concl'd.)

	Reference group	1		2		3	
		Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Some community college		0.69	1.56	0.46	1.09	0.53	1.26
Community college diploma		0.47	1.60	0.50	1.79	0.51	1.86
Some university		−0.30	−0.89	−0.27	−0.84	−0.27	−0.84
University diploma below bachelor's degree		0.95	2.37	0.85	2.26	0.92	2.44
Bachelor's degree or above		1.28	4.77	1.17	4.60	1.03	4.10
Other		−1.10	−0.91	−0.74	−0.65	−0.57	−0.51
Not stated		0.47	1.04	0.56	1.30	0.74	1.71
Credits in Canada	None			1.44	11.17	1.81	7.11
Schooling in Canada	High-school diploma						
Primary only						−1.52	−2.95
Some secondary						−0.13	−0.39
Some trade/vocational						−1.92	−4.51
Trade/vocational diploma						−1.23	−3.23
Some community college						−0.50	−1.44
Community college diploma						−0.31	−0.97
Some university						−0.58	−1.58
University diploma below bachelor's degree						−0.54	−0.80
Bachelor's degree or above						0.41	1.43
Not stated						−0.79	1.92
$\bar{Y}$		3.19		3.19		3.19	
Standard deviation		2.26		2.26		2.26	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.152		0.287		0.319	

Table A-7

Writing test scores, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1		2		3	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		2.78	8.23	2.84	8.42	3.21	9.81
Place of birth	United States						
South America		−1.12	−3.83	−0.95	−3.18	−0.93	−3.28
Western Europe		−0.68	−2.42	−0.39	−1.30	−0.33	−1.13
Eastern Europe		−1.08	−3.35	−0.65	−1.92	−0.16	−0.45
Northern Europe		0.28	1.09	0.28	1.13	0.16	0.66
Southern Europe		−1.92	−7.16	−1.49	−4.86	−1.23	−4.16
Africa		−0.51	−1.50	−0.25	−0.70	−0.27	−0.79
Asia and Oceania		−1.19	−4.60	−0.79	−2.71	−0.84	−2.95
Gender	Female	0.17	1.46	0.17	1.47	0.22	2.01
Year immigration	Before 1950						
Canadian citizen		1.90	2.98	1.65	2.57	1.23	1.99
1950-59		0.49	1.95	0.55	2.20	0.67	2.79
1960-69		0.49	1.93	0.48	1.91	0.63	2.60
1970-79		0.15	0.59	0.14	0.55	0.12	0.48
1980-89		0.41	1.43	0.44	1.56	0.56	2.05
Not stated		0.07	0.08	0.03	0.03	0.20	0.23
Schooling before immigration	High-school diploma						
None		−0.02	−0.10	−0.03	−0.13	−0.19	−0.84
Primary only		−0.31	−1.62	−0.31	−1.65	−0.25	−1.34
Some secondary		−0.35	−1.57	−0.34	−1.50	−0.44	−2.03
Some trade/vocational		−0.38	−0.86	−0.37	−0.83	−0.26	−0.59
Trade/vocational diploma		−0.10	−0.31	−0.10	−0.32	−0.34	−1.13

Table A-7 (concl'd.)

	Reference group	1		2		3	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Some community college		0.62	1.46	0.57	1.35	0.64	1.58
Community college diploma		0.53	1.94	0.53	1.95	0.50	1.91
Some university		−0.22	−0.68	−0.19	−0.61	−0.19	−0.61
University diploma below bachelor's degree		0.92	2.45	0.87	2.34	0.66	1.83
Bachelor's degree or above		1.03	4.10	1.02	4.10	0.83	3.45
Other		−0.57	−0.51	−0.79	−0.70	−0.63	−0.59
Not stated		0.74	1.68	0.66	1.51	0.50	1.20
Credits in Canada	No credits	1.64	6.22	1.61	6.13	1.13	4.36
Schooling in Canada	High-school diploma						
Primary only		−1.37	−2.64	−1.37	−2.64	−1.42	−2.84
Some secondary		−0.10	−0.32	−0.12	−0.37	−0.09	−0.30
Some trade/vocational		−1.94	−4.57	−1.91	−4.51	−1.56	−3.80
Trade/vocational diploma		−1.26	−3.31	−1.22	−3.22	−1.11	−3.04
Some community college		−0.57	−1.64	−0.59	−1.70	−0.62	−1.85
Community college diploma		−0.43	−1.34	−0.45	−1.41	−0.33	−1.07
Some university		−0.80	−2.10	−0.79	−2.08	−0.71	−1.96
University diploma below bachelor's degree		−0.67	−1.00	−0.60	−0.90	−0.55	−0.86
Bachelor's degree or above		0.15	0.47	0.12	0.38	0.06	0.21
Not stated		−0.60	−1.61	−0.63	−1.54	−0.58	−1.46
Academic school program	Not academic	0.46	2.28	0.45	2.23	0.42	2.18
First language not English nor French	English or French			−0.51	−2.89	0.32	1.27
Age starting English or French	0-4						
5-10						−0.47	−1.82
11-15						−0.88	−3.05
16-20						−1.68	−5.08

21 and over			−2.10	−7.53
Never			−2.97	−5.41
Not stated			−2.09	−2.48
$\bar{Y}$	3.19	3.19	3.19	
Standard deviation	2.26	2.26	2.26	
Number	1,102	1,102	1,102	
$\bar{R}^2$	0.322	0.326	0.382	

Table A-8

Writing test scores, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	1		2		3	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant		4.42	11.48	4.61	11.49	4.59	11.08
Place of birth	United States						
South America		-0.88	-3.13	-0.70	-2.49	-0.69	-2.42
Western Europe		-0.31	-1.09	-0.27	-0.94	-0.27	-0.97
Eastern Europe		-0.17	-0.51	-0.22	-0.66	-0.24	-0.71
Northern Europe		0.21	0.88	0.28	1.16	0.27	1.14
Southern Europe		-1.28	-4.41	-1.18	-4.05	-1.13	-3.83
Africa		-0.13	-0.39	-0.08	-0.23	-0.04	-0.12
Asia and Oceania		-0.78	-2.78	-0.78	-2.81	-0.77	-2.73
Gender	Female	0.20	1.84	0.24	2.16	0.23	2.05
Year of immigration	Before 1950						
Canadian citizen		-0.14	-0.22	0.16	0.25	0.16	0.24
1950-59		0.27	1.10	0.14	0.56	0.13	0.52
1960-69		0.02	0.08	-0.15	-0.56	-0.18	-0.64
1970-79		-0.89	-2.90	-0.96	-3.11	-0.95	-3.10
1980-89		-0.58	-1.69	-0.63	-1.84	-0.59	-1.72
Not stated		-0.50	-0.57	-0.66	-0.76	-0.58	-0.67
Schooling before immigration	High-school diploma						
None		-0.59	-2.51	-0.47	-1.99	-0.47	-2.01
Primary only		-0.49	-2.56	-0.36	-1.87	-0.38	-1.97
Some secondary		-0.60	-2.73	-0.50	-2.30	-0.54	-2.46
Some trade/vocational		-0.22	-0.52	-0.17	-0.39	-0.26	-0.60
Trade/vocational diploma		-0.26	-0.88	-0.17	-0.58	-0.23	-0.77

Some community college		0.78	1.96	0.82	2.08	0.81	2.03
Community college diploma		0.48	1.84	0.53	2.05	0.56	2.14
Some university		−0.08	−0.27	−0.16	−0.52	−0.17	−0.56
University diploma below bachelor's degree		0.77	2.15	0.90	2.49	0.87	2.42
Bachelor's degree or above		0.99	4.13	0.90	3.71	0.89	3.69
Other		−0.56	−0.52	−0.05	−0.05	−0.03	−0.03
Not stated		0.17	0.40	0.19	0.46	0.06	0.14
Credits in Canada	No credits	0.88	3.42	0.84	3.26	0.87	3.34
Schooling in Canada	High-school credits						
Primary only		−1.42	−2.89	−1.38	−2.83	−1.33	−2.68
Some secondary		−0.12	−0.39	−0.16	−0.50	−0.16	−0.49
Some trade/vocational		−1.34	−3.27	−1.32	−3.21	−1.28	−3.11
Trade/vocational diploma		−1.06	−2.95	−0.96	−2.69	−0.97	−2.70
Some community college		−0.51	−1.56	−0.42	−1.27	−0.42	−1.28
Community college diploma		−0.28	−0.90	−0.30	−0.98	−0.30	−0.99
Some university		−0.72	−1.99	−0.58	−1.61	−0.56	−1.56
University diploma below bachelor's degree		−0.38	−0.60	−0.49	−0.79	−0.49	−0.78
Bachelor's degree or above		0.06	0.20	−0.09	−0.31	−0.10	−0.34
Not stated		−0.34	−0.85	−0.42	−1.06	−0.42	−1.06
Academic school program	Not academic	0.33	1.70	0.29	1.47	0.29	1.47
First language not English nor French	English or French	0.29	1.16	0.29	1.15	0.26	1.03
Age starting English or French	0-4						
5-10		−0.41	−1.60	−0.28	−1.08	−0.25	−0.99
11-15		−0.74	−2.61	−0.61	−2.11	−0.59	−2.05
16-20		−1.64	−5.04	−1.62	−4.97	−1.59	−4.88
21 and over		−1.90	−6.68	−1.79	−6.29	−1.77	−6.21
Never		−2.09	−3.71	−1.88	−3.37	−1.85	−3.32
Not stated		−1.92	−2.31	−1.57	−1.88	−1.53	−1.84
Age at interview	35-44						
16-24		0.47	1.95	0.33	1.36	0.30	1.23
25-34		0.02	0.10	−0.02	−0.11	−0.04	−0.21

Table A-8 (concl'd.)

	Reference group	1		2		3	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
45-54		−0.75	−4.23	−0.73	−4.14	−0.74	−4.18
55-69		−0.94	−4.81	−0.90	−4.64	−0.90	−4.61
Highest parental schooling	High-school diploma						
None				−0.77	−2.32	−0.81	−2.42
Don't know				−0.91	−4.23	−0.90	−4.19
Primary only				−0.27	−1.56	−0.28	−1.61
Some secondary				−0.30	−1.48	−0.29	−1.42
Some trade/vocational				0.31	0.64	0.28	0.58
Trade/vocational diploma				−1.14	−3.62	−1.11	−3.51
Some community college				−0.29	−0.55	−0.31	−0.59
Community college diploma				−0.14	−0.46	−0.13	−0.42
Some university				0.57	1.32	0.58	1.33
University diploma below bachelor's degree				−0.55	−1.45	−0.56	−1.48
Bachelor's degree or above				0.21	1.04	0.22	1.09
Area population	500,000 and over						
Urban, 100,000-500,000						0.24	1.23
Urban, 30,000-100,000						0.38	1.76
Urban, less than 30,000						−0.19	−0.74
Rural and Prince Edward Island						−0.09	−0.43
$\bar{Y}$		3.19		3.19		3.19	
Standard deviation		2.26		2.26		2.26	
Number		1,102		1,102		1,102	
$\bar{R}^2$		0.399		0.416		0.418	

Table A-9

Writing test scores, persons born outside Canada, Statistics Canada literacy survey, 1989

	Reference group	Coefficient	*t*-value
Constant		4.68	11.35
Place of birth	United states		
South America		–0.74	–2.60
Western Europe		–0.22	–0.79
Eastern Europe		–0.31	–0.90
Northern Europe		0.25	1.04
Southern Europe		–1.11	–3.76
Africa		0.01	0.02
Asia and Oceania		–0.78	–2.74
Gender	Female	0.23	2.03
Year of immigration	Before 1950		
Canadian citizen		0.15	0.22
1950-59		0.10	0.39
1960-69		–0.22	–0.81
1970-79		–0.99	–3.23
1980-89		–0.61	–1.76
Not stated		–0.97	–1.12
Schooling before immigration	High-school diploma		
None		–0.50	–2.13
Primary only		–0.40	–2.11
Some secondary		–0.59	–2.71
Some trade/vocational		–0.28	–0.65
Trade/vocational diploma		–0.21	–0.71
Some community college		0.78	1.99
Community college diploma		0.42	1.62
Some university		–0.21	–0.70
University diploma below bachelor's degree		0.82	2.30
Bachelor's degree or above		0.78	3.20
Other		–0.15	–0.15
Not stated		–0.14	–0.34
Credits in Canada	No credits	0.93	3.60
Schooling in Canada	High-school diploma		
Primary only		–1.30	–2.59
Some secondary		–0.19	–0.60
Some trade/vocational		–1.34	–3.26
Trade/vocational diploma		–0.99	–2.78
Some community college		–0.47	–1.43
Community college diploma		–0.33	–1.08
Some university		–0.60	–1.69
University diploma below bachelor's degree		–0.42	–0.67
Bachelor's degree or above		–0.14	–0.48
Not stated		–0.47	–1.12
Academic school program	Not academic	0.26	1.34
First language not English nor French	English or French	0.25	1.01

Table A-9 (concl'd.)

	Reference group	Coefficient	t-value
Age starting English or French	0-4		
5-10		-0.31	-1.22
11-15		-0.64	-2.24
16-20		-1.59	-4.92
21 and over		-1.78	-6.29
Never		-1.83	-3.29
Not stated		-1.45	-1.76
Age at interview	35-44		
16-24		0.27	1.13
25-34		-0.05	-0.30
45-54		-0.78	-4.39
55-69		-0.90	-4.56
Highest parental schooling	High-school diploma		
None		-1.01	-2.93
Don't know		-0.89	-4.19
Primary only		-0.27	-1.58
Some secondary		-0.33	-1.62
Some trade/vocational		0.33	0.70
Trade/vocational diploma		-1.05	-3.34
Some community college		-0.28	-0.55
Community college diploma		-0.07	-0.25
Some university		0.42	0.95
University diploma below bachelor's degree		-0.43	-1.13
Bachelor's degree or above		0.21	1.04
Area population	Urban, 500,000 and over		
Urban, 100,000-500,000		0.28	1.49
Urban, 30,000-100,000		0.47	2.13
Urban, less than 30,000		-0.14	-0.54
Rural and Prince Edward Island		-0.06	-0.27
Infirmities	None		
Visual problems before age 16		-1.45	-3.33
Visual problems now		1.20	2.86
Hearing problems before age 16		0.36	0.63
Hearing problems now		-0.96	-2.51
Speech disability before age 16		-1.19	-1.19
Speech disability now		0.73	0.59
Learning disability before age 16		-0.21	-0.18
Learning disability now		-0.34	-0.31
Six-month illness before age 16		0.14	0.23
Six-month illness now		1.41	2.42
$\bar{Y}$		3.19	
Standard deviation		2.26	
Number		1,102	
$\bar{R}^2$		0.428	

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